A RIVER RUNS THROUGH IT

Imagining the future of the Glasgow City Region & the Clyde Valley

A DESIGN SPRINT

CONCLUSIONS REPORT

Architecture & Design Scotland
CityUrbanist\Glasgow
Glasgow Urban Lab, Glasgow School of Art
Glasgow City Council
Mackintosh School of Architecture
Urban C:Lab (Buro Happold)

2022

Urban C:Lab

Architecture & Design Scotland

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GLASGOW URBAN LAB THE GLASGOW SCHOOL OF ART

MACKINTOSH SCHOOL OF ARCHITECTURE THE GLASGOW SCHOOL OF ART

Glasgow CITY COUNCIL

EXECUTIVE SUMMARY

The Clyde and its tributaries run through the eight local authorities of the Glasgow City Region that together have a population of just under 2 million (1.87m) making up nearly 40% (37%) of Scotland's population. As a holistic ecosystem, the Clyde and its tributaries is today a neglected waterway network throughout the entire city-region.

In the vocabulary of the Resilient City Network (Rockefeller Foundation), the River Clyde has the potential to create both 'stress' and 'shock' to the metropolitan city-region of Glasgow primarily as a result of flood risk manifest in two ways: the first from downstream flow following serious precipitation events and the second from upstream flow associated with increased sea levels as a consequence of climate change.

There is a clear and present need to address both flows and 'space' for the river.

There have been a number of initiatives for the River but there has never been a single piece of visioning work that seeks to consider the future of the River as a rural and urban ecosystem from its source to the sea that relates to the settlement pattern through which it passes in concert with the strategic challenges of the transportation networks and the networks of vacant and derelict land and stranded assets lying within the post-industrial metropolitan area of the Glasgow city region.

In September 2021 a group of over sixty stakeholders, designers, students and public sector professionals collaborated on a two-day charrette to explore this challenge and reimagine the future of the Clyde Valley and the Glasgow City Region.

This document summarises the charrette, the challenges and provocations.

This page (right): The River Clyde through the city of Glasgow. *Image courtesy of Buro Happold.*

Urban C:Lab

HOW TO READ THIS DOCUMENT

Purpose

It is important to note that the purpose of this investigation is to serve as a think piece - to put forward *provocations*, not proposals - for the Glasgow City and Clyde Valley Region. A design sprint (charrette) is by its very nature a fast-paced sprint through a series of complex and nuanced challenges. It does not attempt to serve as a robust stakeholder engagement or comprehensive commissioned study.

The speed of this exercise is an important factor to encourage participants to think freely and creatively, in a combustion of thoughts and ideas.

In this same spirit, this document aims to capture this investigation, but does not put forward resolved conclusions or proposals. Rather, it concludes with a number of questions and provocations, to oxygenate and agitate the discussion around the future for the Clyde Valley region.

Structure

This document begins with a short introduction to the context, to set the scene for the investigation, including a whistle stop tour of some of the pivotal moments in the region's development history.

The following section introduces the challenge for this investigation, and references key priorities and opportunities for the future of the Glasgow City and Clyde Valley Region.

The investigation itself – a two part design sprint (similar to a design charrette) – is described in section three, which includes an overview of the sprint structure and systems-thinking approach.

Disbursed throughout this project are a number of precedent projects* in Scotland and beyond that demonstrate the kind of system- thinking approach.

Sections four to seven capture the key themes and ideas that emerged from the design sprint investigation, and, as this sprint was held online due to the pandemic, includes snapshots of the virtual workspace that each group produced during their exploration.

Finally, section eight concludes by summarising some of the key questions or provocations that emerged from this exercise.

This page (right): The River Clyde through the city of Glasgow. *Image courtesy of Buro Happold.*

The precedents are examples of what can be done – not solutions of what should be done. Precedents are not answers but they are examples of higher order thinking for Glasgow and for the city region.

FACILITATORS

Urban C:Lab

CityUrbanist\Glasgow

Urban C:Lab (Buro Happold)

Urban C:Lab is a multi-disciplinary programme initiated by Buro Happold, exploring emergent change within the built environment and collaborating with architects, scientists, academics, think tanks, businesses and governments, through a series of activities ranging from academic research, debates, conferences, workshops and design sprints.

City Urbanist Glasgow

City Urbanist\Glasgow: Brian Mark Evans is Professor of Urbanism + Landscape at the Mackintosh School of Architecture, the GSA and director of the Glasgow Urban Lab. In 2019, he was invited to become Glasgow's City Urbanist, an independent civic role acting as strategic adviser on place, design and the city with a local, national and international perspective.

Glasgow City Council

Glasgow City Council is the biggest local authority in Scotland, serving a city population of over 635,000 people. As the heart of the Glasgow City Region and a place shaped by the Clyde, Glasgow is increasingly looking to the river to ensure it plays a full role in the city's economic and social life.

Architecture & Design Scotland
Ailtearachd is Dealbhadh na h-Alba

GLASGOW URBAN LAB THE GLASGOW SCHOOL OF ART

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Architecture & Design Scotland

Architecture & Design Scotland: ADS is Scotland's national design champion, and believes in the power of design to improve people's lives. The vision driving A&DS is a Scotland whose places are healthy, sustainable and thriving, where everyone works together to shape their future.

Glasgow Urban Lab, Glasgow School of Art

The Glasgow Urban Lab is a 'think-tank' and 'do-tank' with a focus on the relationship between research, practice and education in the field of urbanism and design with a focus on regeneration and placemaking.

The Mackintosh School of Architecture, GSA

The Mackintosh School of Architecture is a specialist school within The Glasgow School of Art (GSA). Part of the learning experience at the GSA since the middle of the 19th century, the 'Mac' has an international reputation for aesthetically and intellectually rigorous architecture, set in an urban and social context..
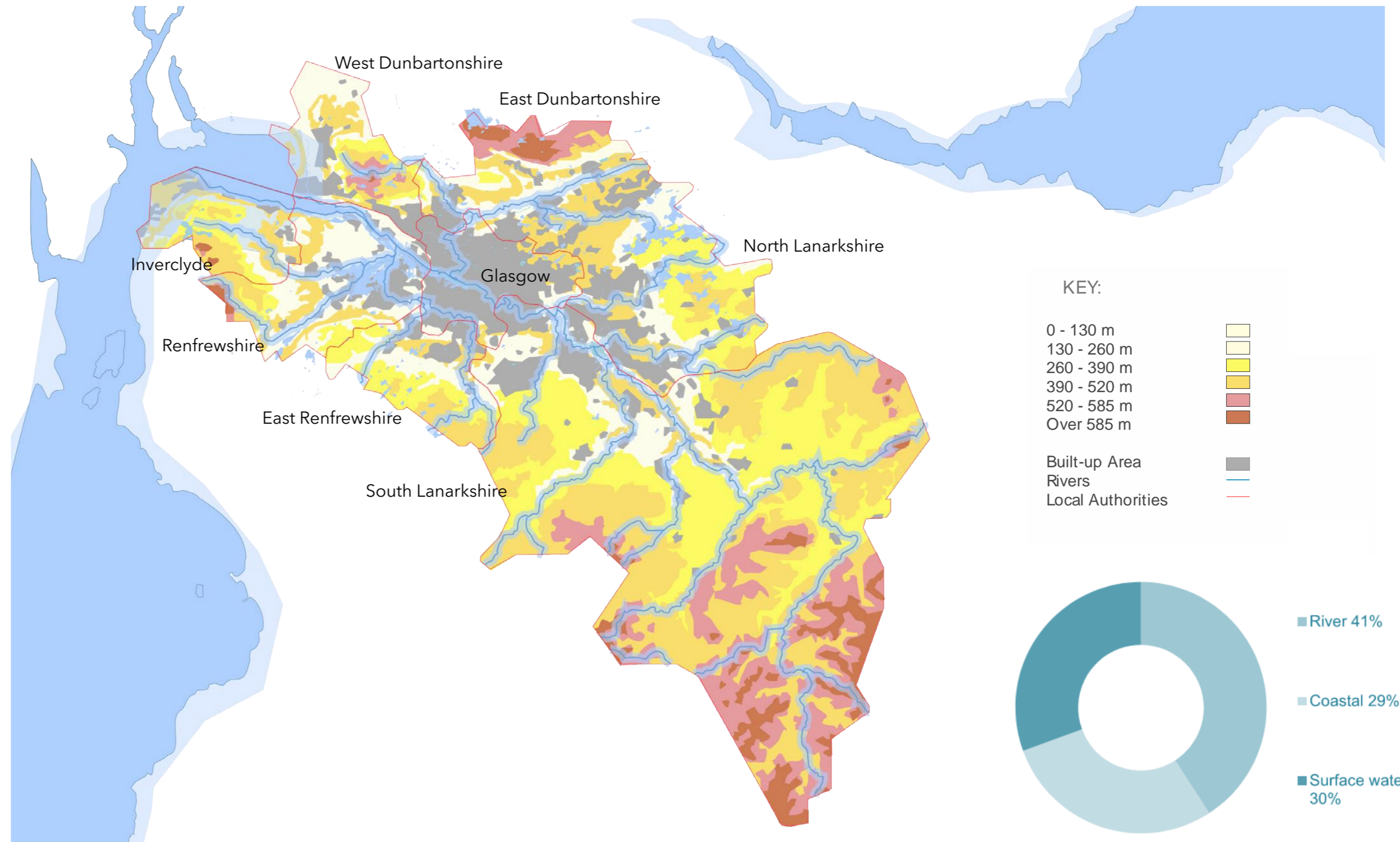
CONTENTS

CONTEXT

The watershed and drainage basin of the River Clyde

The River Clyde is 170km long and has a catchment surface area of 3200 km2. This area defines the Glasgow City Region.

The large catchment and topography of the area means that river flooding is the most likely risk as a consequence of climate change. This may be compounded by surface water and coastal flooding.

Left: Hydrological riverine ecosystem in the Glasgow City Region (*Map courtesy of Mackintosh School of Architecture*)

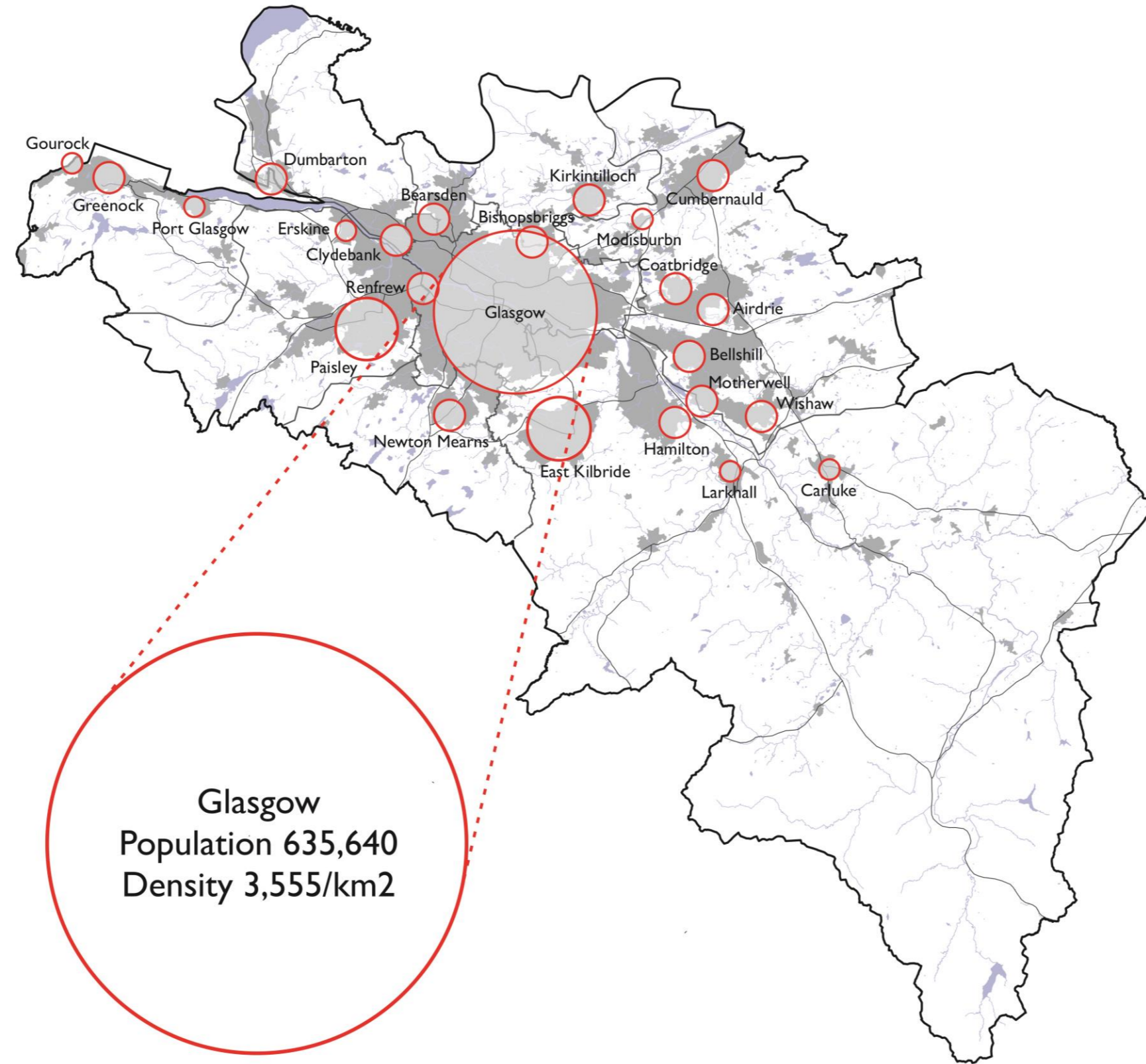**Right:** SEPA Annual Average Damages by flood source (*Map courtesy of Mackintosh School of Architecture*)

West Dunbartonshire

East Dunbartonshire

North Lanarkshire

Glasgow

Inverclyde

Renfrewshire

East Renfrewshire

South Lanarkshire

KEY:

- 0 - 130 m
- 130 - 260 m
- 260 - 390 m
- 390 - 520 m
- 520 - 585 m
- Over 585 m

- Built-up Area
- Rivers
- Local Authorities

■River 41%

■Coastal 29%

■Surface water 30%

The Glasgow City Region and The River Clyde

The Glasgow City Region consists of eight local authorities with a combined population of nearly 1.9 million – approximately 35% of Scotland's population.

The continuous built-up area of Glasgow extends far beyond the administrative boundary of city and has a population of between 1.2 and 1.4 million.

The River Clyde and its tributaries permeate every settlement throughout the city region providing a continuous blue network for the regions communities.

Right: Glasgow city region population distribution. *Image source: Glasgow Urban Lab*

Gourock
Greenock
Port Glasgow
Dumbarton
Erskine
Bearsden
Clydebank
Bishopsbriggs
Kirkintilloch
Cumbernauld
Modisburbn
Renfrew
Coatbridge
Glasgow
Airdrie
Paisley
Bellshill
Motherwell
Newton Mearns
Wishaw
Hamilton
East Kilbride
Larkhall
Carluke

Glasgow
Population 635,640
Density 3,555/km2

Settlement Size by Population

10,000 - 20,000
20,000 - 50,000
50,000 - 75,000

more than 600,000

Lower Clyde catchment

Glasgow city area

Approximate study area

Upper Clyde catchment
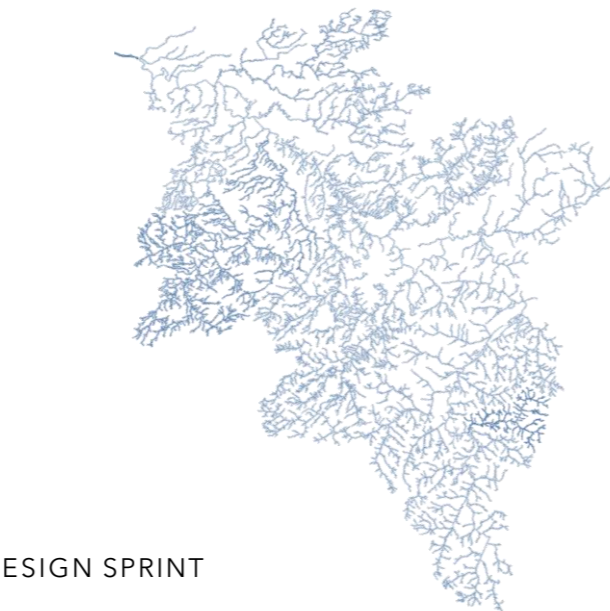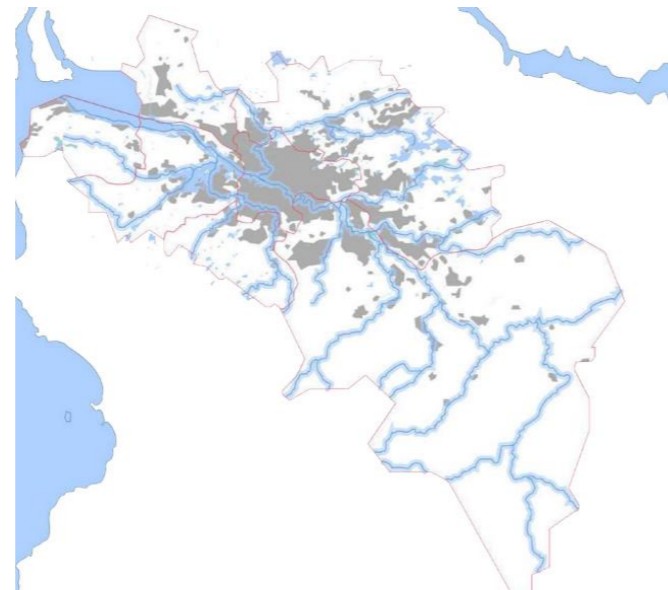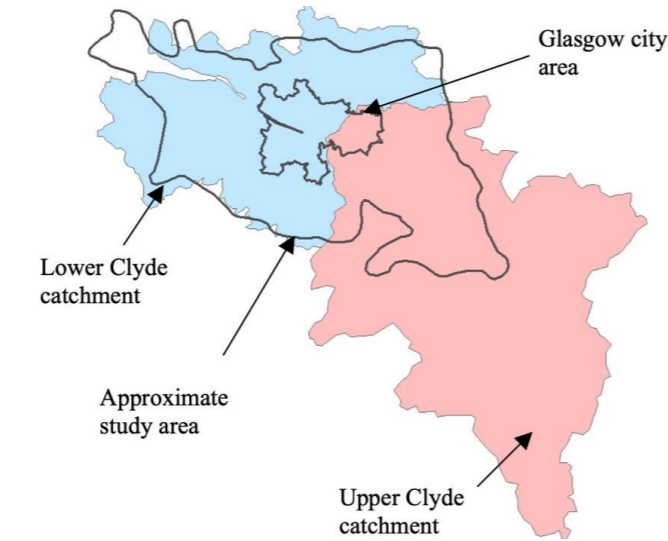
Glasgow City Region

Hydrological riverine ecosystem & Metropolitan City System

Top left: The Upper and Lower Clyde Catchments *Source: BGS Review of Clyde Basin River Catchments*

Middle left: Principal watercourses, the metropolitan built-up area and local authority boundaries. *Source: The Glasgow Urban Lab*

Bottom left: The watercourses of the Upper Clyde Catchment. *Source: SEPA Clyde management plan*

Right: Glasgow city region and population distribution overlayed with the hydrological riverine ecosystem. *Source: The Glasgow Urban Lab.*
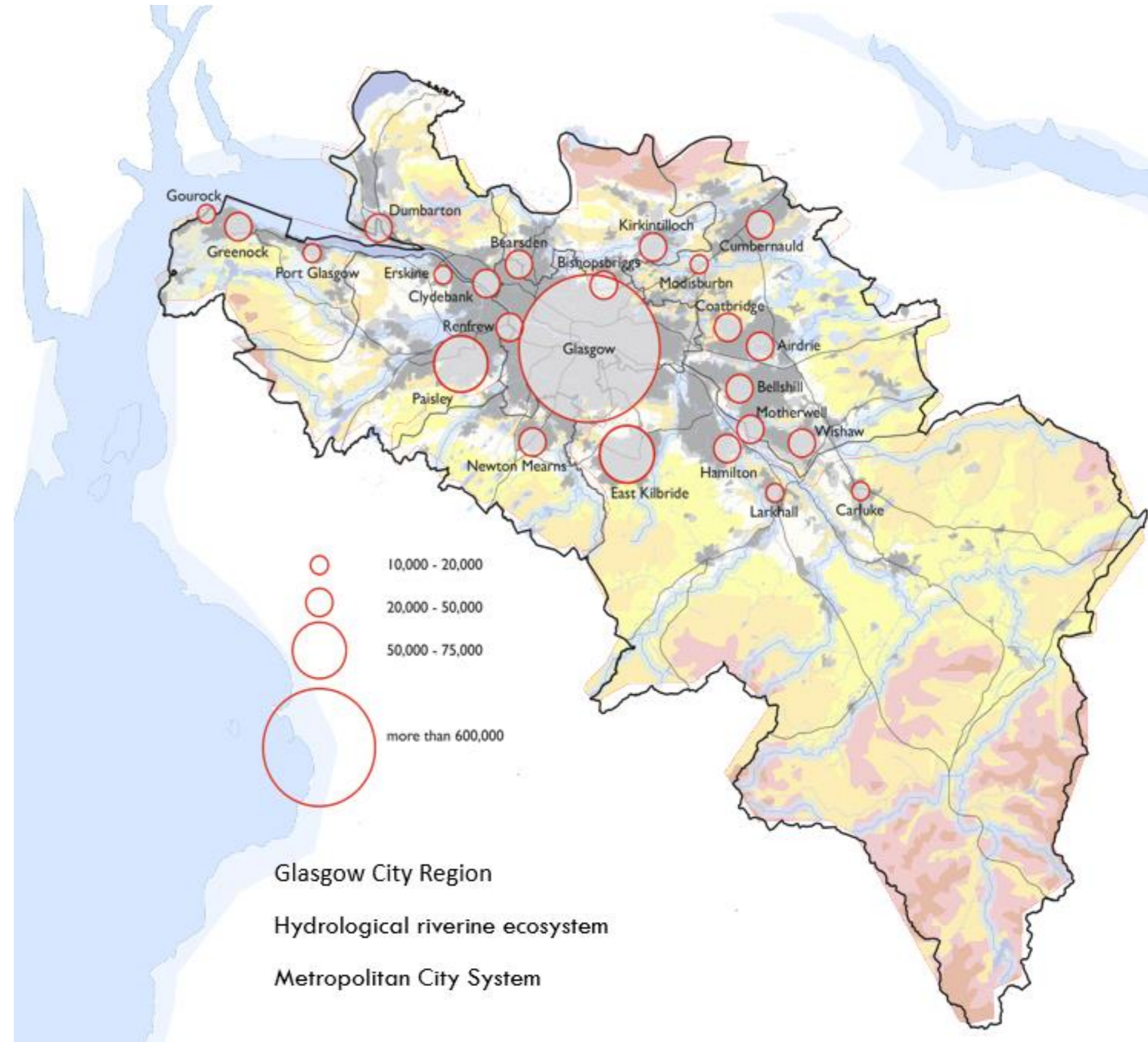
10,000 - 20,000

20,000 - 50,000

50,000 - 75,000

more than 600,000

Glasgow City Region

Hydrological riverine ecosystem

Metropolitan City System

Places along the Clyde

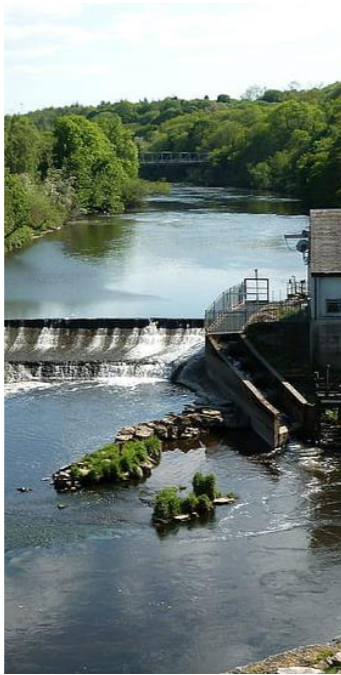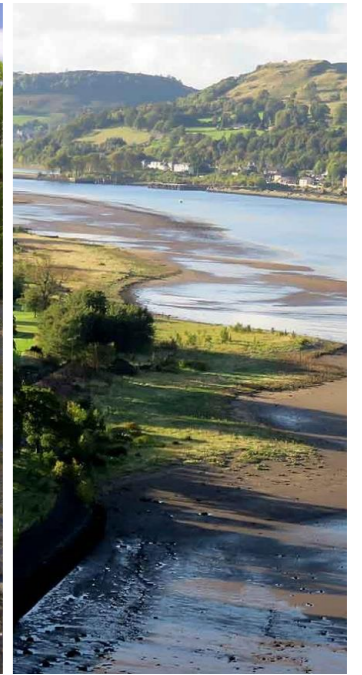| Corra Linn
The Fall Line | New Lanark
First Industry | Blantyre - Water Power
& A River Wide Weir | Into the East End
Clyde Gateway | Through the City to
the Firth | Urban River
Tidal Weir | Clyde Cart
Confluence | Clydebank and the
Erskine Bridge | River Kelvin | Estuarine Firth at
Dumbarton |
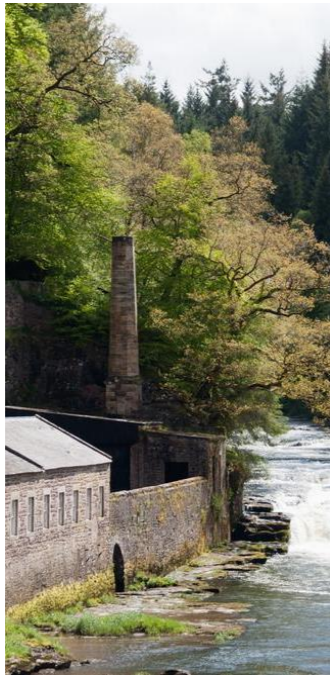
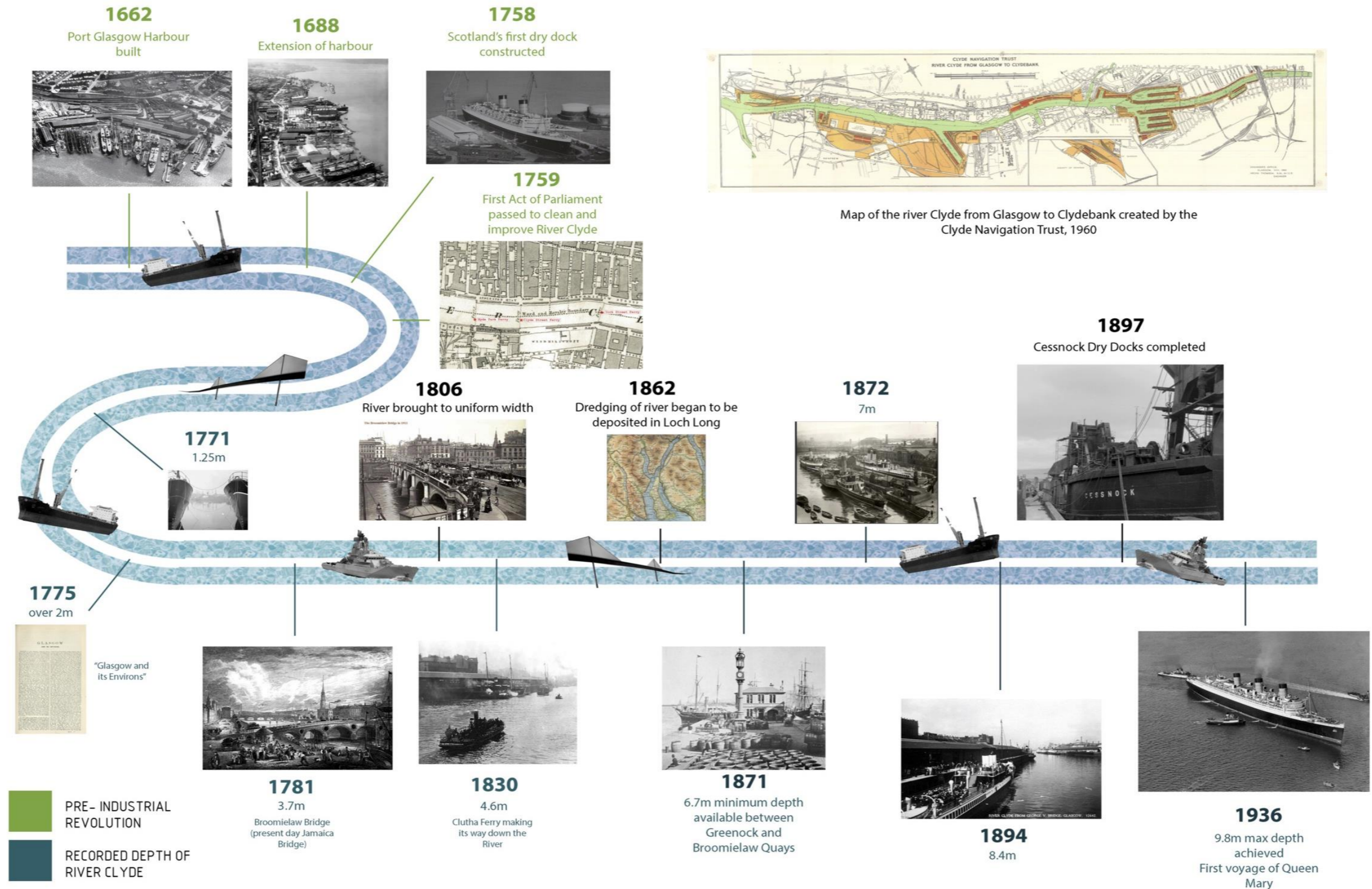*Picturesque upper reaches*   *River City*   *Bucolic moments*

A brief timeline of the Clyde River Basin

The Clyde has played a significant role since prehistoric times. During the Paleolithic era, the Romans, the Kingdom of Strathclyde and the Medieval period, the river has shaped urban settlements, serving as a transport and trade route, a battle ground, a frontier zone and a route for territorial expansion.

More recently, since the early modern period, the Clyde river region has been influenced by four distinct eras, described in the following pages.

Right: Image courtesy of Mackintosh School of Architecture

MACKINTOSH SCHOOL OF ARCHITECTURE THE GLASGOW SCHOOL OF ART

1662
Port Glasgow Harbour built

1688
Extension of harbour

1758
Scotland's first dry dock constructed

1759
First Act of Parliament passed to clean and improve River Clyde

Map of the river Clyde from Glasgow to Clydebank created by the Clyde Navigation Trust, 1960

1897
Cessnock Dry Docks completed

1806
River brought to uniform width

1862
Dredging of river began to be deposited in Loch Long

1872
7m

1771
1.25m

1775
over 2m

"Glasgow and its Environs"

1781
3.7m
Broomielaw Bridge (present day Jamaica Bridge)

1830
4.6m
Clutha Ferry making its way down the River

1871
6.7m minimum depth available between Greenock and Broomielaw Quays

1894
8.4m

1936
9.8m max depth achieved
First voyage of Queen Mary

PRE- INDUSTRIAL REVOLUTION

RECORDED DEPTH OF RIVER CLYDE

1850-1925
Industrialisation

This era saw Glasgow grow from an agricultural and ecclesiastical centre to an industrial giant. The geographical position of Glasgow had previously contributed to enormous economic growth from cotton and tobacco trade, and steam power, local coal and iron resources enabled Glasgow to transition into a manufacturing centre. From here it developed a heavy engineering specialism, including rail and shipbuilding. By 1864, there were twenty shipyards operating on the Clyde, and by 1870, half the British shipbuilding workforce were employed on the Clyde.

The shallow water of the Clyde prevented ships going further than Port Glasgow or Greenock so the challenge of dredging the Clyde was embarked upon. This was completed in the 1880s, just as Glasgow's steel industry was being developed.

The industrial growth gave the city status, prosperity, wealth, and an international reputation as one of the biggest cities in the world. However, it also came at a price for Glasgow's citizens, whose living conditions had deteriorated significantly by the early 20th century.

1945-1980
Deindustrialisation

In the years following WWII, the City's industrial base, which had been artificially supported by a wartime economy, suffered systemic failure and Glasgow entered a second era of economic hardship and widespread poverty.

Top to bottom: Clyde ship building; Experiments in modernist city planning; Degraded living environments. *All images courtesy of Glasgow City Council.*

Urban C:Lab

Large scale deindustrialisation gave rise to mass redundancies and unemployment; between 1961 and 1981, a quarter of jobs in Glasgow were lost. During this twenty year period, one third of the population left the city. The slow growth of alternative businesses and industries and limited investment left Glasgow and Clydeside in economic decline.

A national policy to depopulate the city, together with experiments in modernist city planning, escalated deindustrialisation, and decline. Victorian tenements were demolished and replaced with tower blocks that were meant to improve living conditions but instead led to displaced communities and impoverished people across the city.

A major storm in 1968 caused city-wide damage and destruction. From the efforts to create

temporary repairs, a group of architecture students introduced a new paradigm of renewal that provided the impetus to establish citizen-led housing associations. This created a movement to repair and transform the tenements of the city as it was realised that deindustrialisation and unemployment were the determinants of poverty and ill-health rather than the City's stone buildings.

1980-2000
Regeneration

Glasgow embarked on a third era characterised by renewal, regeneration and cultural renaissance that re-built the City's reputation for life and place.

This work of the citizen-led housing associations led to a change in direction for national policy;

This page (top to bottom): Tenements in rehabilitation in the 1980s *(Image source: Brian Evans);* Sighthill transformation Regeneration Area *(Image source: Glasgow City Council).*

demolition and clearance of stone buildings was halted and replaced with a regeneration programme to improve existing housing and maintain communities within their neighbourhoods.

Similar approaches were used in policies to support businesses and help regrow the city's economy, which started to flourish from the mid-1980s. The 1980s 'Glasgow's Miles Better' campaign to promote the city as a tourist destination and as a location for industry helped rebrand the city.

2000-2022 Renaissance

In 2003, in an era-defining moment, Glasgow's Tenants voted for the voluntary transfer of City-owned housing to a newly established city-wide Glasgow Housing Association. Development funding was

transferred to Glasgow City Council as the strategic housing authority to deliver affordable housing to meet the city's diverse and changing needs and to enable Glasgow to move forward with a housing-led regeneration programme shaped by local communities.

By 2010, Glasgow had established eight transformation regeneration areas with a ten to fifteen year programme to deal with areas of the city still scarred by mid-twentieth century deindustrialisation. This was done by putting affordable housing at the heart of the city's regeneration.

Since the establishment of the Scottish Parliament, Glasgow has worked in partnership with the Scottish Government and with housing associations to retain and develop momentum in the provision of social and affordable housing across Glasgow and in the

wider city-region, together home to nearly 40% of Scotland's population. The work is being delivered by Transforming Communities: Glasgow, a partnership between the Scottish Government, Glasgow City Council and the Glasgow Housing Association.

Pictured: Glasgow tenement housing stock. *Image courtesy of Glasgow City Council*

Glasgow today, in numbers

6/10 Glaswegians live within **500m** of vacant and derelict land (VDL) *(Glasgow Centre for Population Health)*

Glasgow has **3,500 ha** of green space with **91** public parks.

Today, **41%** of Glaswegians commute by car, **30%** by public transport and **27%** walk or cycle *(Glasgow Centre for Population Health).*

36% of Glasgow's households experience fuel poverty – a growing trend.

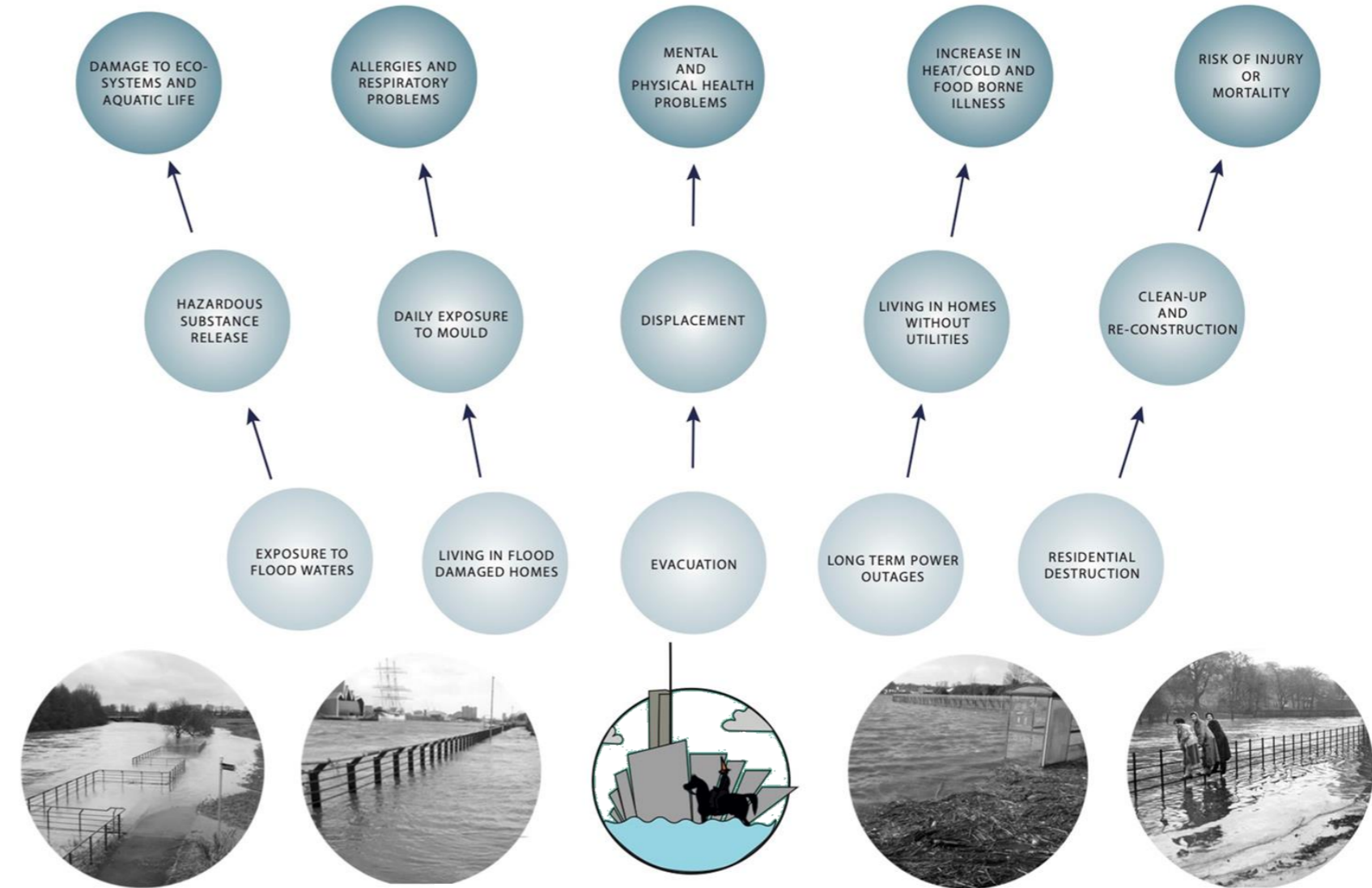Glasgow has areas with the lowest life expectancy in Scotland (Men **54.6,** Women **57.6**).
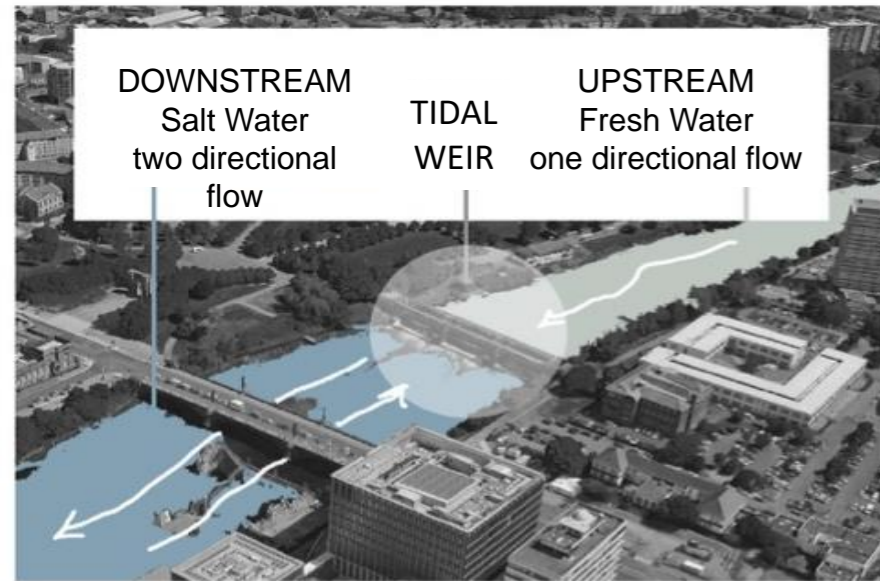
The River Clyde and its tributaries run for **170 km** from their source to the sea.

The Tidal stretch of the River Clyde extends into the City of Glasgow. Glasgow is vulnerable to Sea Level Rise with scientists predicting significant portions of the city to be vulnerable to inundation by **2050.**
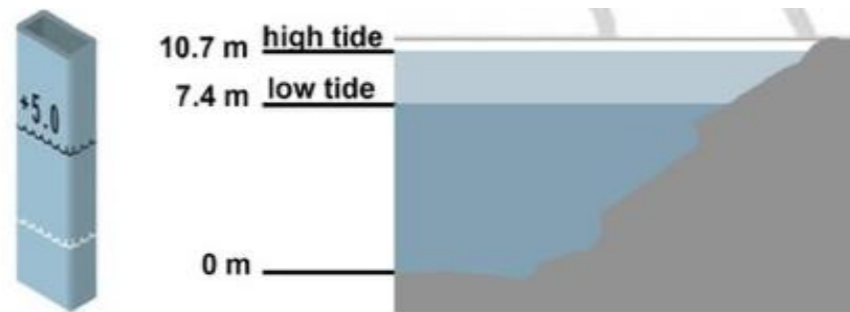
CURRENT DAILY TIDAL WATER LEVEL VARIATIONS +4.3

The consequences of increased upstream rainfall and downstream tidal surge in Glasgow

DOWNSTREAM Salt Water two directional flow

TIDAL WEIR

UPSTREAM Fresh Water one directional flow

Right: Images courtesy of Mackintosh School of Architecture

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+5.0

10.7 m high tide
7.4 m low tide
0 m

DAMAGE TO ECO-SYSTEMS AND AQUATIC LIFE

ALLERGIES AND RESPIRATORY PROBLEMS

MENTAL AND PHYSICAL HEALTH PROBLEMS

INCREASE IN HEAT/COLD AND FOOD BORNE ILLNESS

RISK OF INJURY OR MORTALITY

HAZARDOUS SUBSTANCE RELEASE

DAILY EXPOSURE TO MOULD

DISPLACEMENT

LIVING IN HOMES WITHOUT UTILITIES

CLEAN-UP AND RE-CONSTRUCTION

EXPOSURE TO FLOOD WATERS

LIVING IN FLOOD DAMAGED HOMES

EVACUATION

LONG TERM POWER OUTAGES

RESIDENTIAL DESTRUCTION

PRECEDENT:
METROPOLITAIN GLASGOW STRATEGIC DRAINAGE PARTNERSHIP, GLASGOW

The Metropolitan Glasgow Strategic Drainage Partnership (MGSDP) is a multi-agency partnership between public bodies involved in managing surface water, water quality, flood risk, investment planning and economic delivery, with a vision to 'Sustainably Drain Glasgow',

The Partnership's vision, which encompasses seven local authority areas is to deliver a range of projects to "transform how the city region thinks about, and manages rainfall, to end uncontrolled flooding and improve water quality".

These projects include flood alleviation, river water quality improvement, and environmental improvement schemes. The MGSDP is also undertaking a range of studies and research as part of their development plan.

Top right: Geographic Extent of MGSDP – showing WwTW catchments (shaded), local authority boundaries and primary watercourses (*MGSDP Surface Water Management Masterplan*).

Right inset: Guiding Principles of MGSDP's Strategic Vision (*Source: MGSDP*)

Right: Carstairs St Retrofit Highway Bioretention - linear water feature / swale and highway raingardens to attenuate surface water runoff and direct it to the local watercourse (River Clyde) rather than the combined sewer system (*Source: MGSDP*).
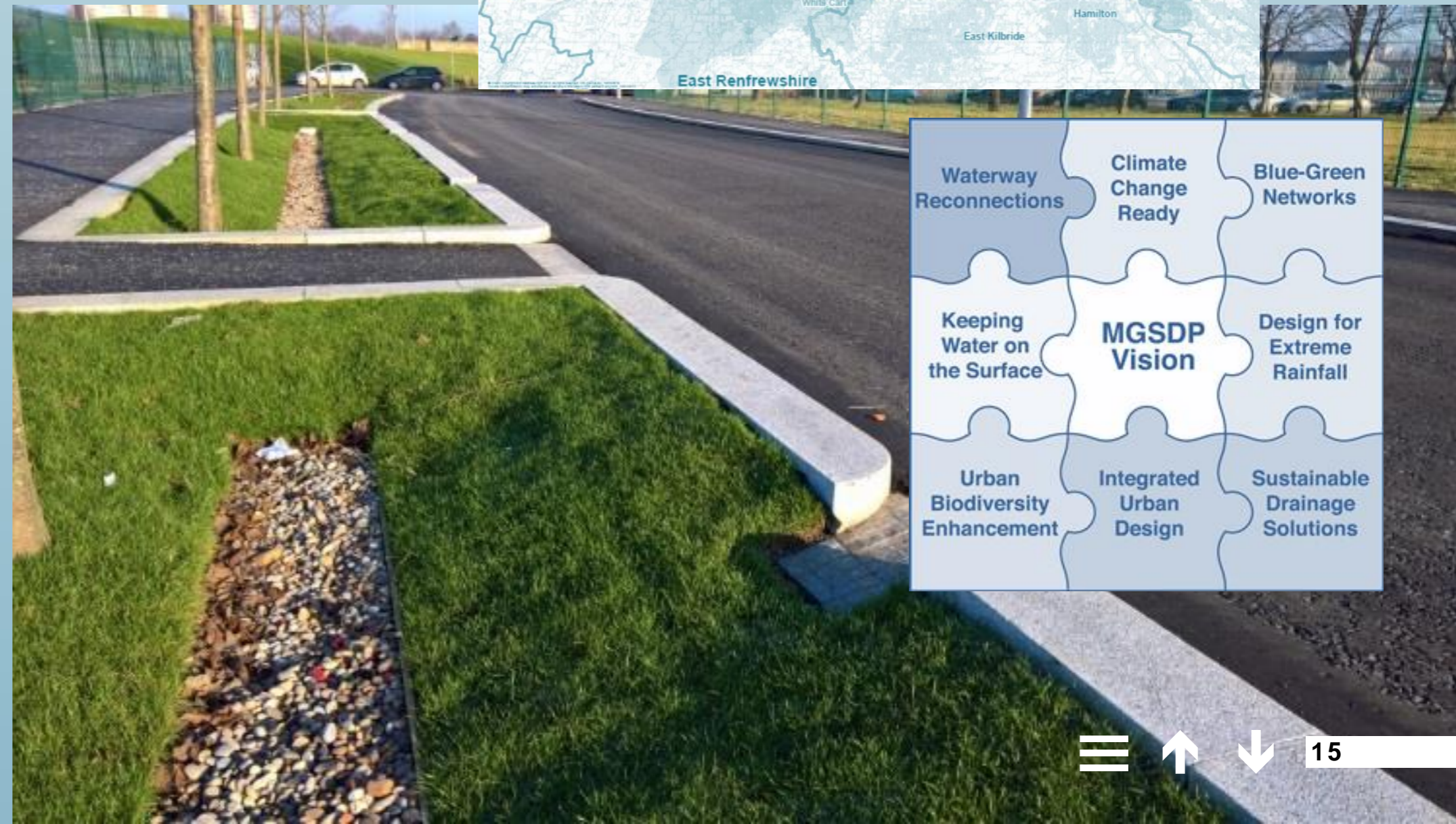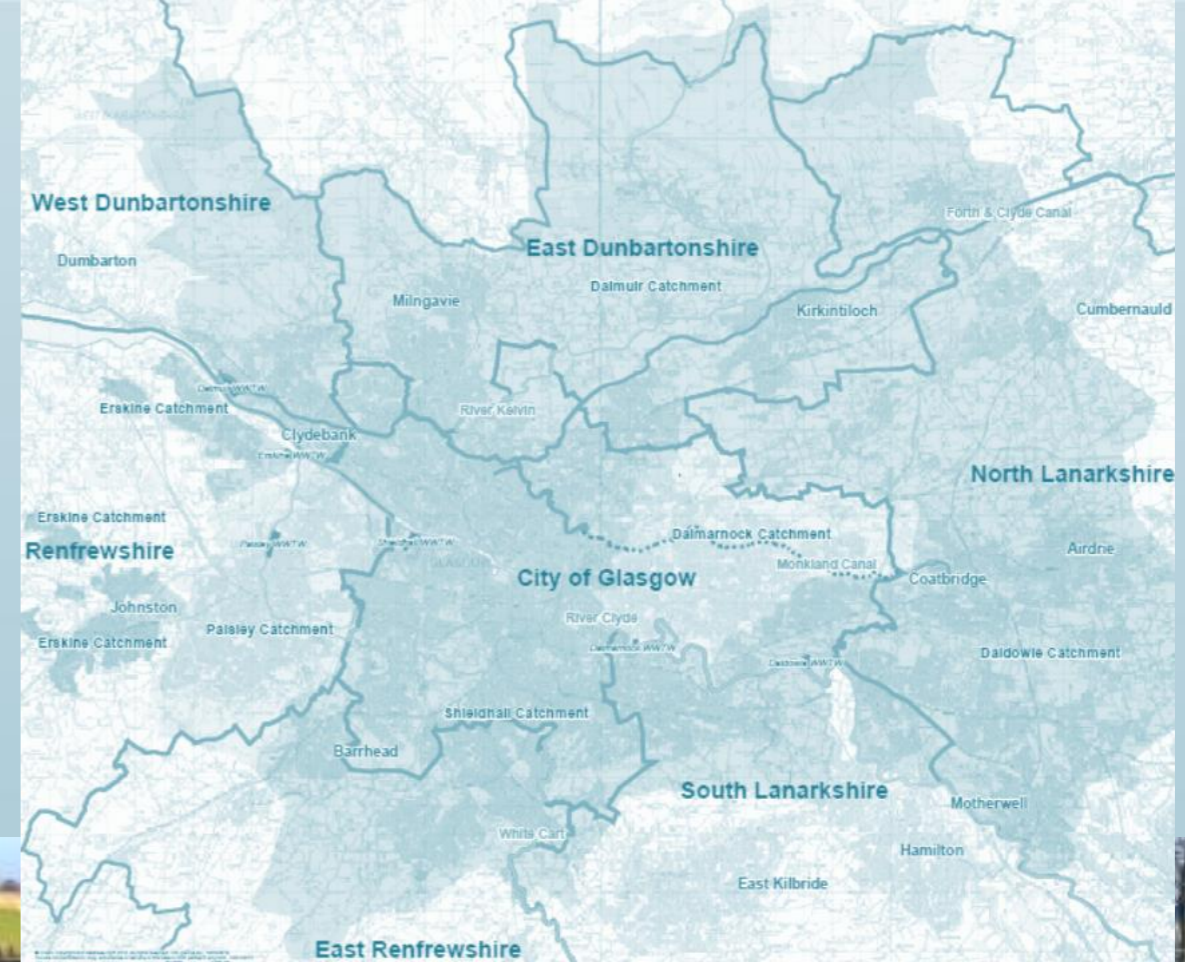
THE CHALLENGE

The work informing this document was undertaken in the weeks prior to COP26 held in Glasgow in November 2021, so the global Sustainable Development Goals (SDGs) introduced by Transforming Our World (the 2030 Agenda for Sustainable Development) therefore seems like a good place to begin.

Fig-01 shows the SDGs embracing the principal outcomes from Scotland's National Performance Framework which in turn encompass Climate Change outcomes and at its heart, a vision for climate change adaptation. Vertical integration of the SDGs gives us a common language to work across scales and across sectors.

Fig-02 from UN Habitat puts SDG 11 (Sustainable Cities and Communities) at the heart of conceptual thinking and relates the targets of SDG 11 to all the other SDGs and their targets. The SDGs are rightly much quoted and are now used as a common language across the globe so it is worth remembering that in the 2030 Agenda, The Declaration states that the SDGs are comprehensive, far-reaching and people-centred (Article 2) and that, as a consequence, are integrated and indivisible and designed to balance the economic, social and environmental pillars of sustainable development (Article 5).

Left (Fig-01): The global UN Sustainable Development Goals (SDGs), Scotland's National Performance Framework and Climate Change Adaption Outcomes *(Source: Scotland and the Sustainable Development Goals, Scottish Government, 2020*

Right (Fig-02): The global goals (SDGs) are integrated and indivisible *(Source: UN-Habitat)*

Fig-01

Figure II Interlinkages between Sustainable Development Goal 11 and the other Goals

Fig-02

This systems thinking is fundamental to the current advice from the Secretary General that cascades through all UN agencies and in 2021 pre-COP26 publications from UN-Habitat that re-iterates the message that the battle for climate change will be won or lost in the cities of the world that should be addressed across whole of government, whole of society action through four drivers of change shown here in **Fig-03.**

A. Development & implementation of URBAN policy;

B. strengthening URBAN governance;

C. long-term and integrated URBAN/Territorial PLANNING and DESIGN;

D. effective, innovative, sustainable finance framework & instruments.

Fig-03

What this means is that we have a series of challenges for our cities shown in **Fig-04.**

We need to take these messages, demystify them and express them in terms understandable by local people concerned about the quality of their lives and the quality of their places.

Decarbonisation and deep retrofit of entire building stocks – residential, office, retail and every other land use; decarbonisation and retrofitting entire movement systems (Mobility as a Service – MAAS) climate adaptation of the entire drainage network, entire river systems, and the consequences of sea level change. Balancing Climate Adaptation with social justice, well-being and economic prosperity of humanity an ecosystems.

I. Decarbonisation and deep retrofit of entire building stocks – residential, office, retail and every other land use;

II. Decarbonisation and retrofitting entire movement systems (Mobility as a Service – MAAS)

III. Climate adaptation of the entire drainage network, entire river systems, and the consequences of sea level change.

IV. Balancing Climate Adaptation with social justice, well-being and economic prosperity of humanity an ecosystems.

Fig-04

There has been a great deal of material published on the topic. City 2040 published by Taylor Wessing and a number of universities establishes for outcomes for the Future City (**Fig-05**). The work came up with four propositions shown in the diagram opposite. Replacing siloed thinking with collaboration is certainly important and systems-thinking is central to this.

Centre: *City2040 (Image credit: Taylor Wessing)*

Outcomes for

THE FUTURE CITY:

A. A balanced multi-hub system;

B. Hybrid and uncertain – both flexible and complex;

C. Health driven and inclusive planning of urban space;

D. Maximise clean air and reverse urban climate change.

Fig-05

This design sprint is intended to help make systems thinking accessible to people in their places, in their communities and in their lives; to understand the interlinkages between the systems that impact on the metropolitan city of Glasgow and the Clyde Valley.

As well as many significant initiatives taking place in Glasgow, there are legacy strategic issues that Glasgow has to face.

One of the most significant of these is the motorway system. The image top left is from the notorious Bruce Plan from the late 1940s. The image on the right from a helicopter at the time of the Glasgow Garden Festival in the mid-1980s. The cathedral is visible in both of these and the legacy of mid-twentieth century planning remains with us today. Although much has been done to recovery the situation, the image top right shows the historic thread of the high street of Glasgow running from the cathedral down to the lowest fording point on the river. The motorway network as well as the Clyde River system is one of the systems of flow of the Glasgow City-region.

Top to bottom: (Image source: Brian Evans); (Image source: Glasgow City Council); (Image source: Creative Commons CC-BY).
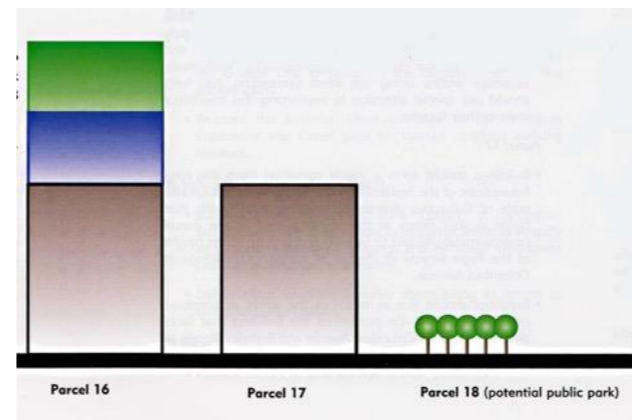
THE CHALLENGE

The image on the top right is a recent photograph taken on the M8. Two of the lanes have been removed in order to facilitate the construction of a bridge linking the north of Glasgow into the city centre. When Glasgow is speculating about the design and construction of a metro system, could we not, perhaps, take a couple of the lanes of the M8 and use that to create an express metro through the city, with stops that utilise the undercroft of the M8 as spaces to create interchange opportunities with city streets and neighbourhoods and the subway system.

The image below is an example from Curitiba, Brazil, where the then mayor Jaime Lerner took out lanes from roads and created an integrated bus system in a piece of innovative thinking, reusing the surface of a highway to create an example of *Mobility as a Service.*

These images on the right show some examples of the Massachusetts turnpike in Boston, where the City looked at the economics of building over the highway and used the air rights above for development.

On the diagram below, it is possible to understand the economics of the build and how much extra needs to be built above the highway in order to create new public realm.


Parcel 16   Parcel 17   Parcel 18 (potential public park)

A   B   C

One of the most interesting aspects of the work that was done in Boston, is the holistic city-thinking of development and urban design in terms of composition of the city skyline and how buildings might be aligned, might be composed, in order to create aesthetic skyline for the city.

And of course, Boston took that thinking further with the **Big Dig** and put some of the freeway system underground in order to create a new green system in particular along the top of the cut and cover structure.
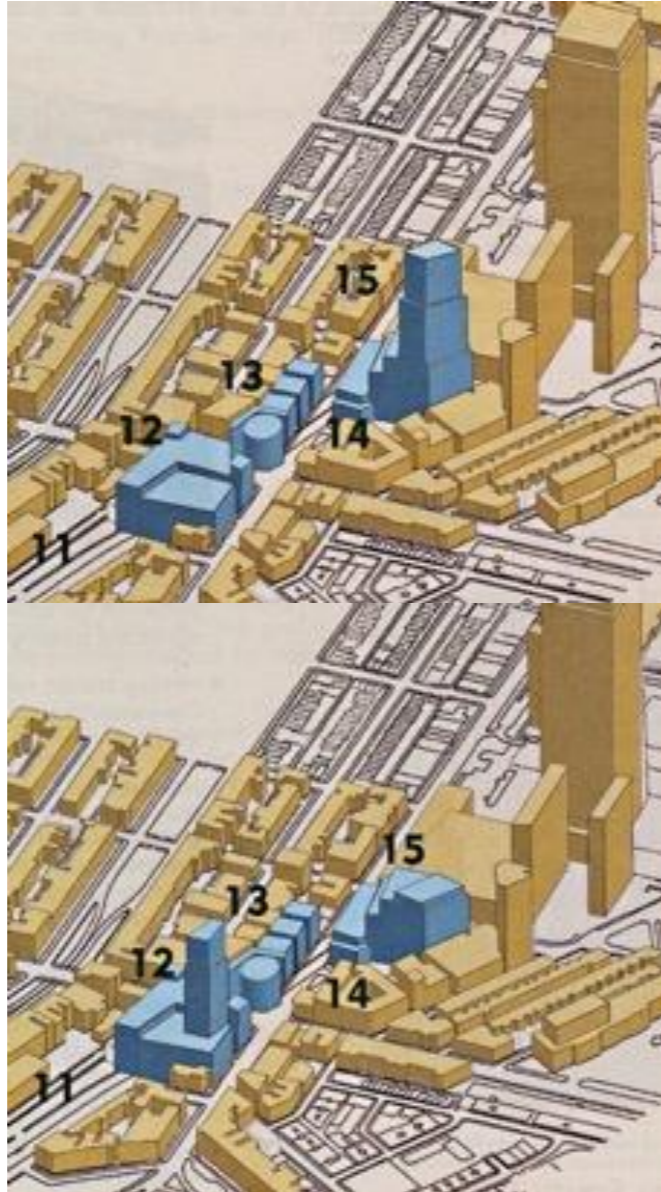
All images: (Image source: City of Boston).

THE CHALLENGE

Here is an example of the **High Line** in New York, a renowned project to reuse redundant infrastructure in order to be able to create not only a park but the impetus for redevelopment.

These examples include three sets of creative city-thinking:

- reusing the solum of a highway as a park;
- building over the highway;
- reconstructing the highway underground.

Surely as we face the major challenges of the climate emergency, it is time that Glasgow began to think seriously about these major infrastructure challenges in a creative way.

All images: (Image source: Brian Evans).

THE CHALLENGE

One of the biggest challenges and legacy issues in Glasgow is the River Clyde.

The diagram on the top right compares the River Clyde from the City Centre to the Erskine Bridge at a similar scale to the River Thames from Hammersmith to the Thames Barrier.

The legacy issue that Glasgow needs to address is very substantial and is not just related to the river itself of course.

This page: (Image source: Urban C:Lab).

ERSKINE BRIDGE

GLASGOW CENTRAL

15KM

N

HAMMERSMITH

THAMES BARRIER

18KM

N

It is inappropriate and unwise to catastrophise the issues of sea-level change and flooding around about the river. But perhaps we may learn from examples elsewhere for example from Dutch colleagues in Nijmegen, and the famous **Room for the River** project that was led in the first instance by HNS Landscape Architects. This and other similar precedents are discussed further in this document.

Left: (Image source: Glasgow City Council)

Right: (Mackintosh School of Architecture)

GROUP 20

Edris Goubin L'Azou
Giorgios Kazantzis
Perla Llosa Hernandez
Moa Maurex
Mani Motta
Gabriele Padriezaite

**Glasgow Re-Imagined :
Reclaimed Water Landscape**

The purpose of this exercise is to think about the next step of establishing pre-conditions. The systems interactions that take place around a metropolitan city.

Where do they interact together? How does topography interact with water systems?

How does that interact with vacant and derelict land?

What are the points of coincidence between that and between the transportation networks?

Where might we make some of these interventions?
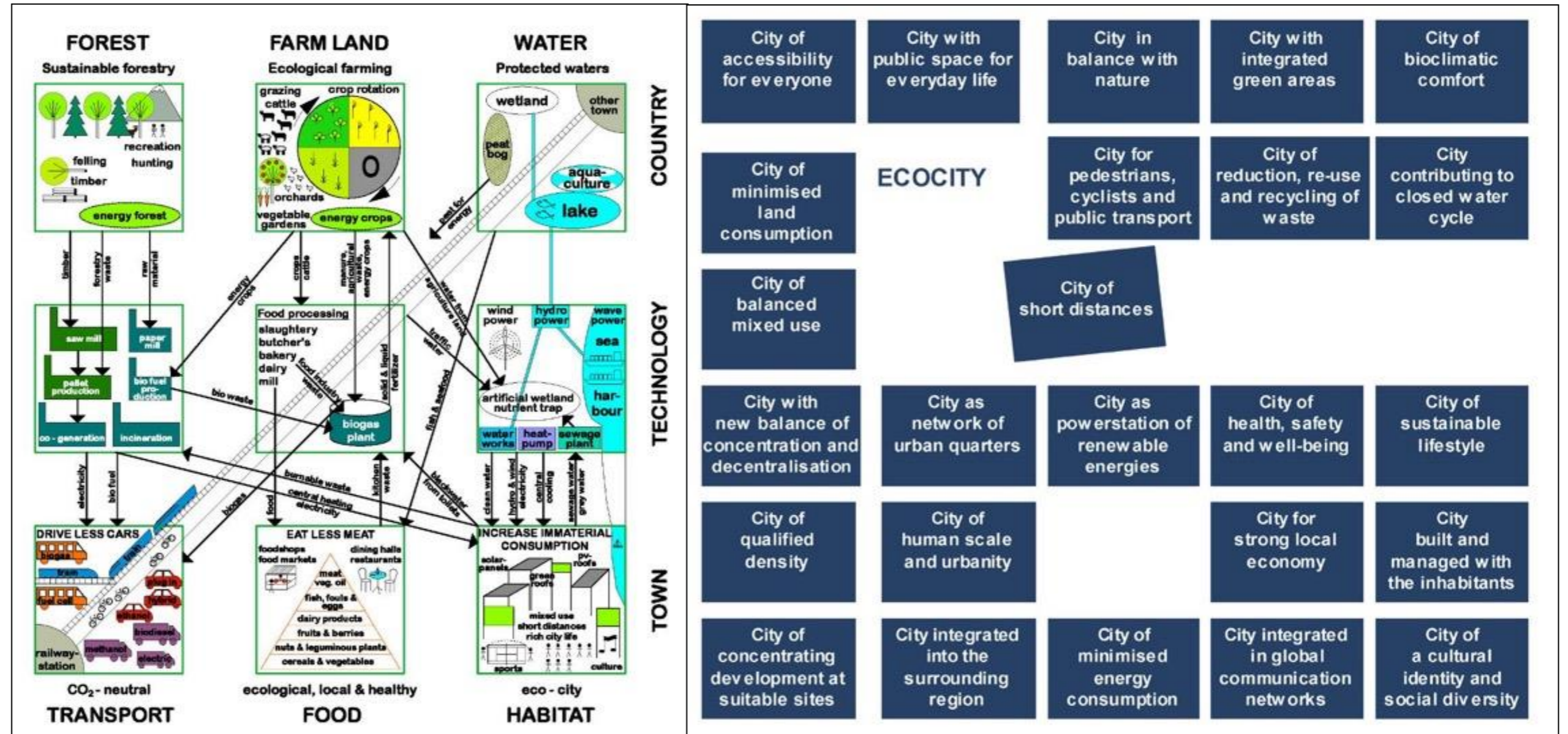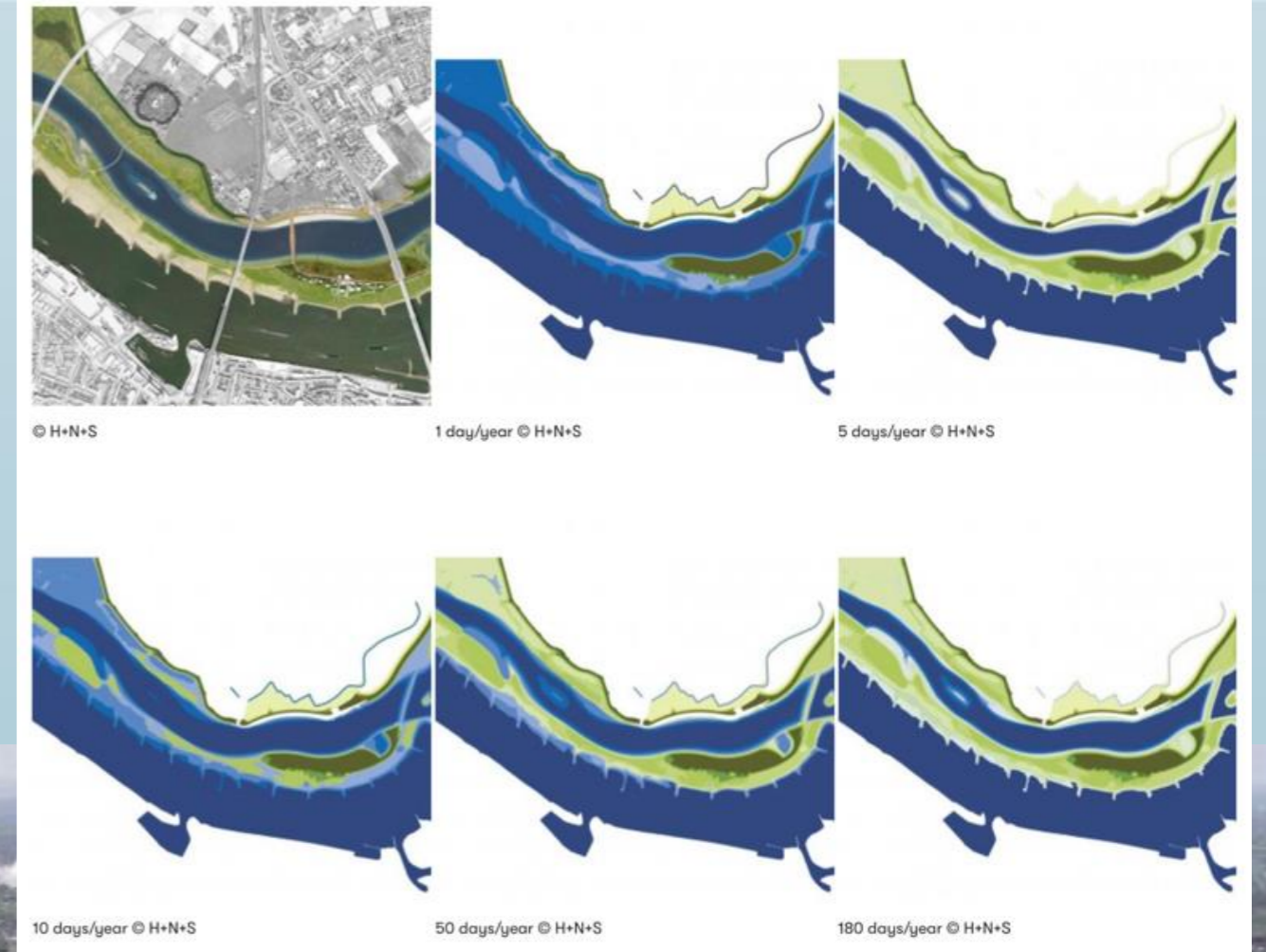
PRECEDENT:

ROOM FOR THE RIVER, NIJMEGEN

At Nijmegen, the Waal River bends sharply and narrows. This creates a bottleneck, which often caused flooding of the historic city centre of Nijmegen.

Faced with increased risk of flooding due to climate change, the city of Nijmegen decided to give more room to the Waal River, at the same time protecting nearby natural habitats and providing recreational space.

The implemented measures created an island that is now used as a unique urban river park in the heart of Nijmegen with room for living, recreational activities, culture, water and nature.

This page (left to right): Nijmegen before the intervention, at high rise, Nijmegen redesigned with 'Room for the River' *Images courtesy of H+N+S Landscape Architects and Johan Roerink/Aeropicture*

© H+N+S   1 day/year © H+N+S   5 days/year © H+N+S

10 days/year © H+N+S   50 days/year © H+N+S   180 days/year © H+N+S

THE INVESTIGATION

Introduction

In September 2021, a group from Buro Happold's Urban C:Lab programme, Glasgow's City Urbanist, Glasgow School of Art's Glasgow Urban Lab, and Architecture & Design Scotland, hosted a design sprint* to explore the future of the Glasgow City region and the Clyde Valley, teaming up with stakeholders, academics, students and professionals from the built environment sector, NGOs, and local, regional and national governments.

The aim of this design sprint was to:

- Enable and encourage participants to adopt new ways of seeing the context, challenges and opportunities for Glasgow and the Clyde Valley.

- Enable and encourage participants to adopt and apply systems-thinking – actively blurring the boundaries of siloed agendas, in order to stimulate integrated propositions. The sprint included a focus on hydrological, ecological, environmental, social, economic, movement and infrastructure systems across the Glasgow City Region as a whole and focus on points of coincidence between them.

- Produce innovative propositions and perspectives for the future of the Glasgow City-Region and the Clyde Valley, that intentionally sit outside the confines of conventional local, regional or national rhetoric.

- Contribute to and energise the existing narratives around the future of the Clyde Valley region and engage public and city stakeholders and opinion shapers in conversation.
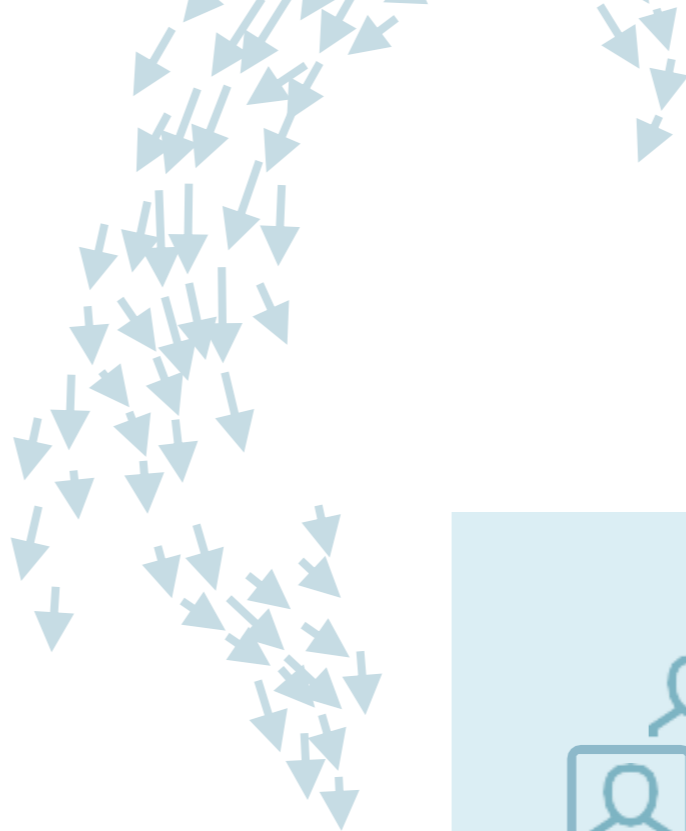
*What is a design sprint?

Adapted from Google Ventures, a design sprint, similar to a design charrette, is a concentrated, focused process for co-creating ideas and rapid prototyping solutions to big challenges.
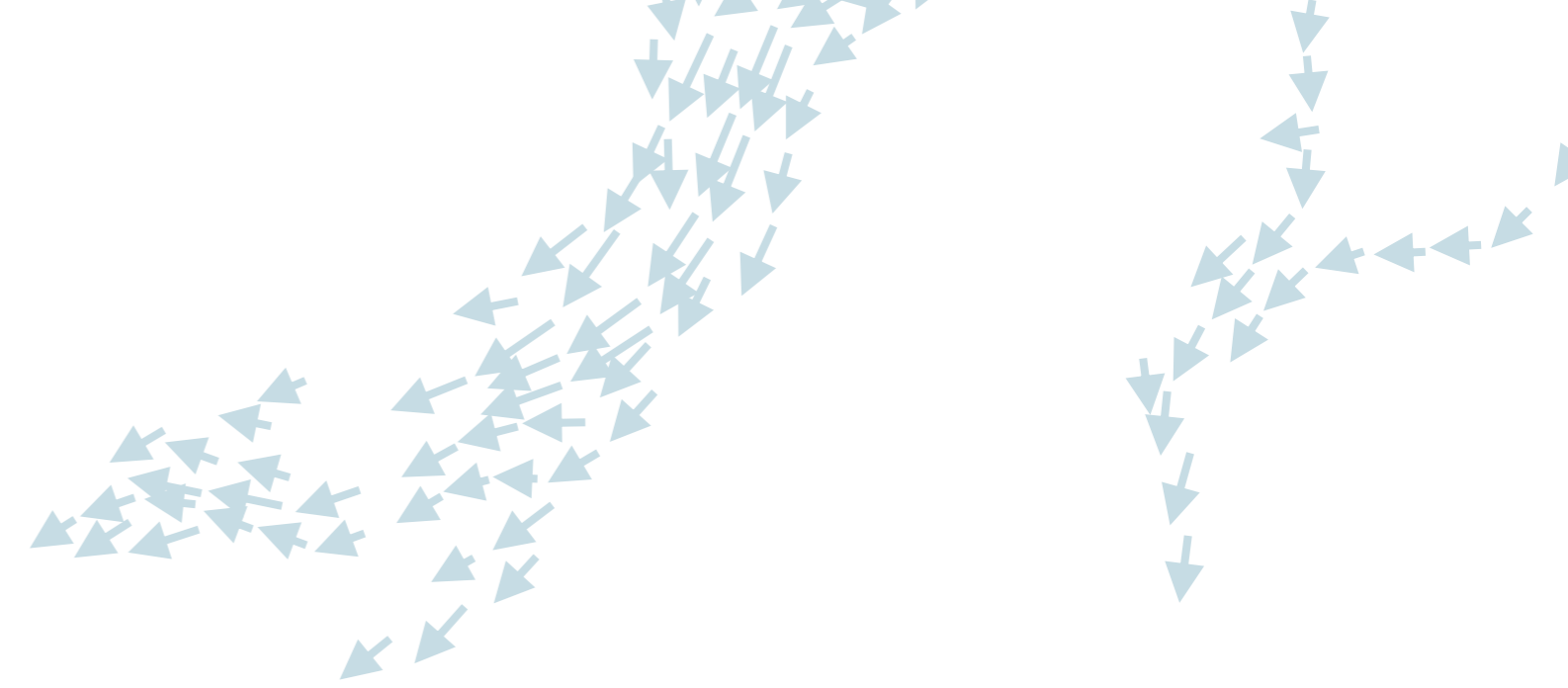
The format

The sprint was split over two days, attended by over 60 participants, arranged into groups of 6-8 with a range of different backgrounds, levels of seniority and lived experience.

Below: Diagram by Urban C:Lab, showing the two-part structure of the design sprint, held over two days in September 2021 *(Image: Urban C:Lab)*
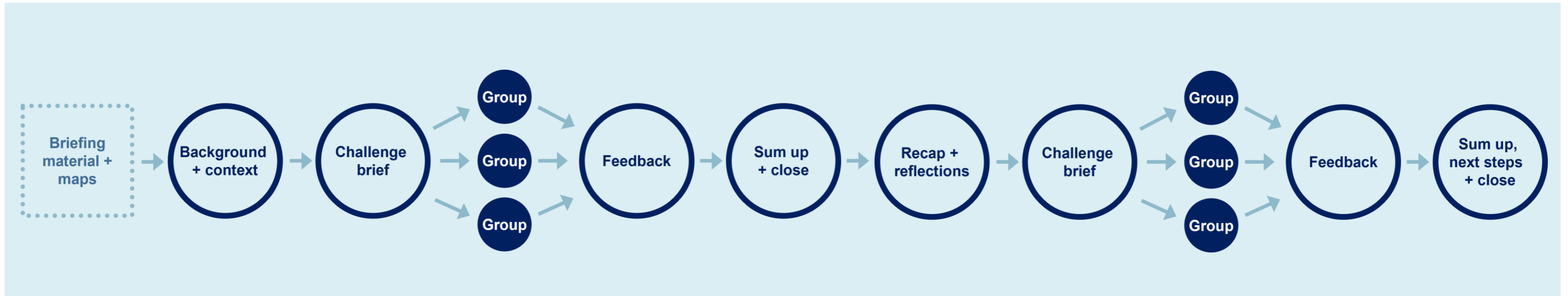
DAY 1:
Systems-thinking
based investigation

The first day was a diagnostic session, where we focussed on investigating and expanding our thinking about the context, opportunities and challenges, with an emphasis on the overlaps between different systems.

Each group was provided a different combination of maps, each capturing a number of layered systems - hydrological, ecological, environmental, social, economic, movement and infrastructures - to provide different layered lenses through which to explore and consider the context.
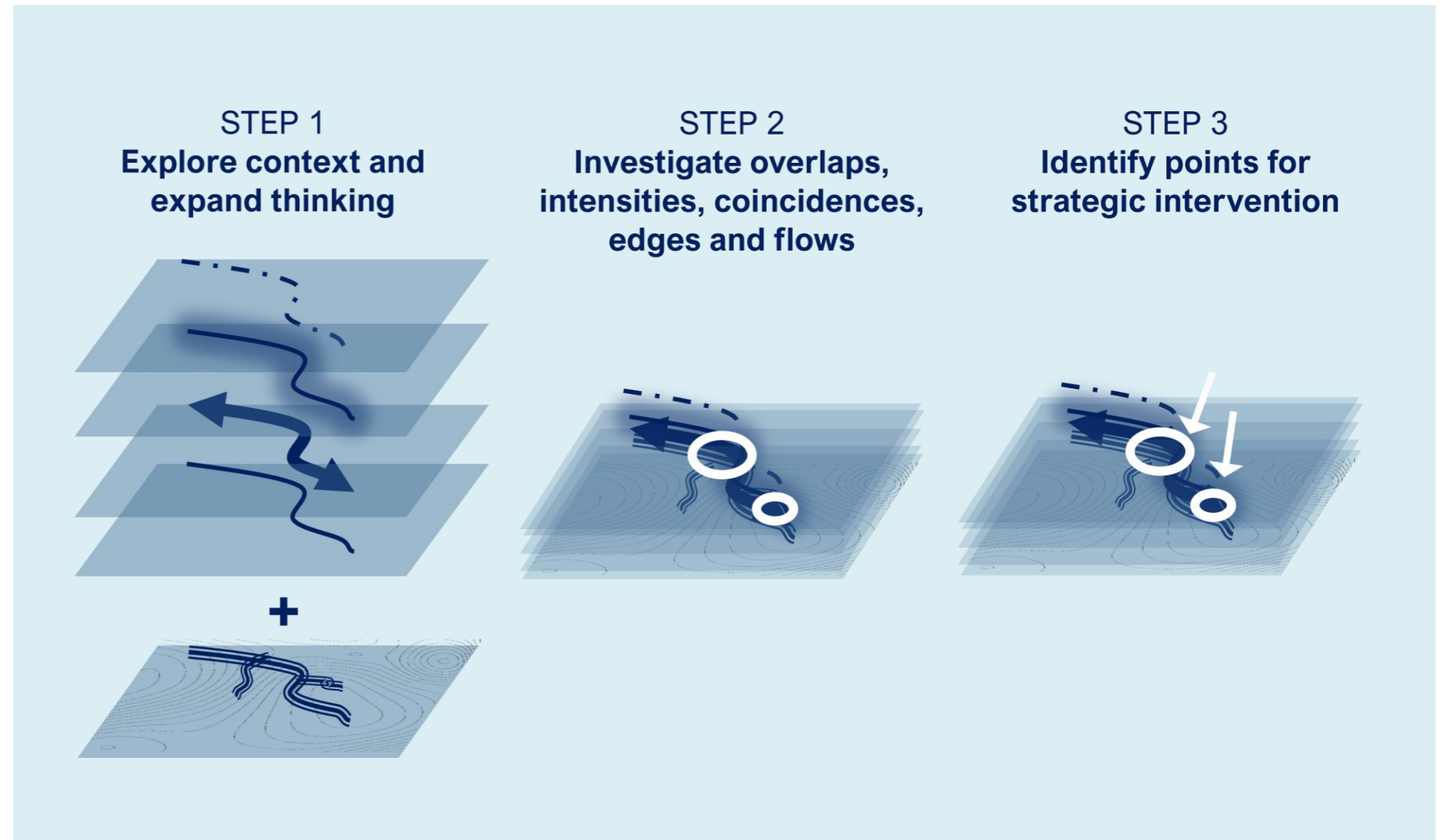
The aim of these maps was to expand our thinking about a context many of the group knew very well, and to focus our minds on the interactions between these systems.

Each group was asked to investigate the overlaps, intensities and coincidences, edges and flows: Where vacant land overlaps with an economic centre or transport intensifies around greenspace. Where the edge of a flood zone meets the edge of a local authority. Or where the flow of traffic coincides with the flows of the water ways.

From this investigation, each group identified sites or conditions for strategic intervention-points where an intervention will not only cut across different systems, but leverage or create interconnectivity or resilience between them.

Right: *Diagram by Urban C:Lab, showing the design sprint methodology for part 1 (day 1) of the design sprint (Image: Urban C:Lab)*

STEP 1
Explore context and expand thinking

STEP 2
Investigate overlaps, intensities, coincidences, edges and flows

STEP 3
Identify points for strategic intervention

DAY 2:
Developing propositions
for strategic intervention

Then on Day Two, we built on this investigation, to generate proposals for interventions at these strategic sites.

Each group began by generating numerous ideas, then narrowed this down by evaluating the ideas against some key criteria: Economic, Social and Environmental factors, as well as application of systems-thinking, scalability, funding and governance. The final part of the challenge was to develop a pitch for the strongest proposition.

Right: Diagram by Urban C:Lab, showing the design sprint methodology for part 2 (day 2) of the design sprint *(Image: Urban C:Lab)*
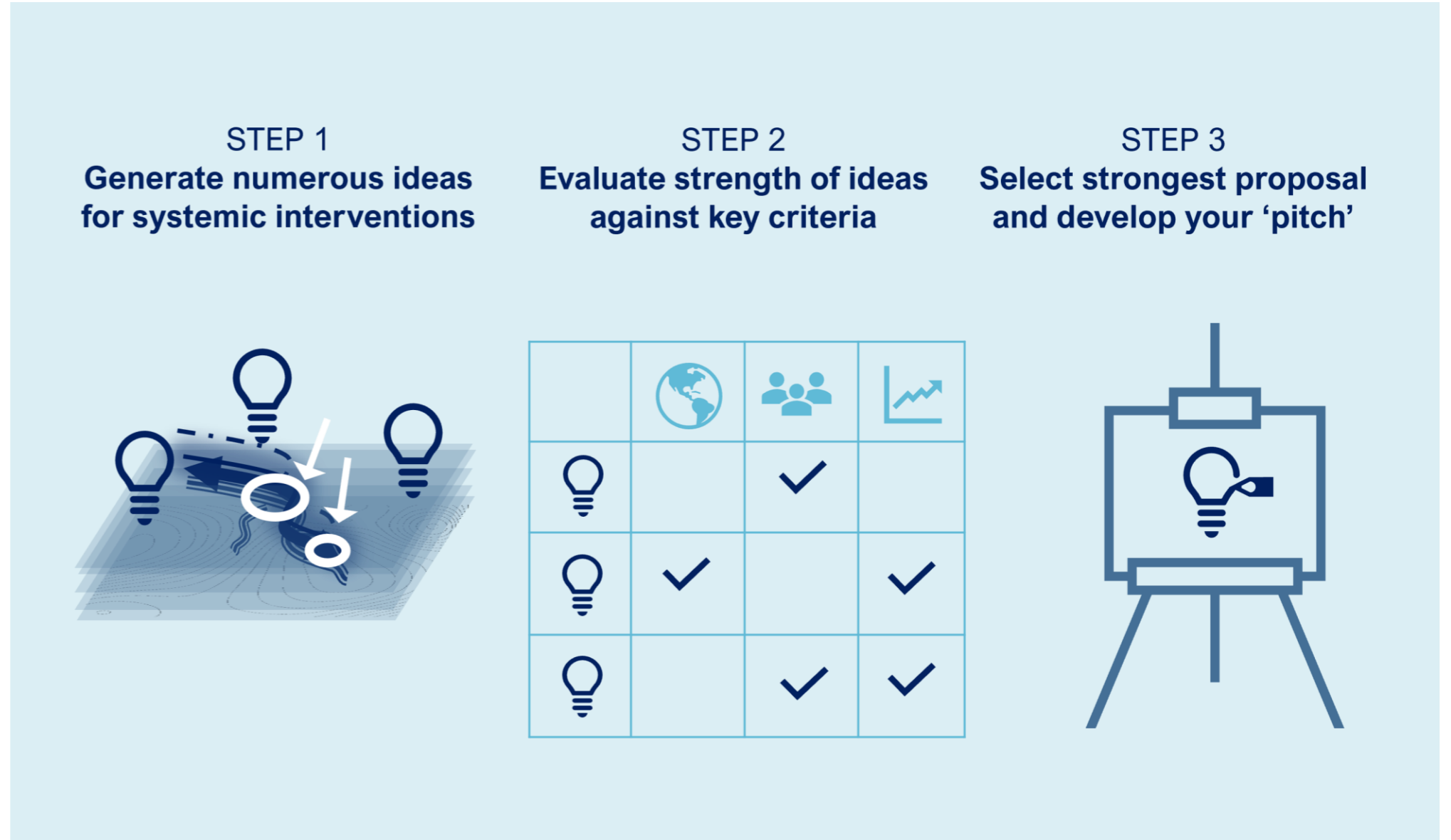

STEP 1
Generate numerous ideas for systemic interventions

STEP 2
Evaluate strength of ideas against key criteria

STEP 3
Select strongest proposal and develop your 'pitch'

DAY 1
SYSTEMS & INTERACTIONS

Each group was provided a different combination of maps, each capturing a number of layered systems - hydrological, ecological, environmental, social, economic, movement and infrastructures:

Green & blue infrastructure

Rivers, tributaries and green space (parkland and wooded areas)

Built up area & topography

Built up areas and topography

Economy

Employment density (jobs per KM2, employment change, strategic centres and economic locations

Transport

Key transport networks (roads, railways and subway lines)

Flood risk

Predicted effects of flooding (coastal, river and surface water)

Derelict & vacant land

Derelict and vacant land, including adjacent 'buffer zones'.

Population

Population density (residents per KM2) and deprivation (SIMD)

Governance

Local authority boundaries

Below: Some of the maps that were provided to participants of the design sprint, illustrating overlaps between different systems and attributes. *Maps produced by students of Glasgow School of Art's Glasgow Urban Lab.*

Each group was provided a different combination of maps, each capturing a number of layered systems - hydrological, ecological, environmental, social, economic, movement and infrastructures.

The groups interrogated these maps, looking for overlaps, intensities and coincidences between the different systems. Based on this investigation, the groups identified a number of conditions and specific sites for strategic intervention, including:
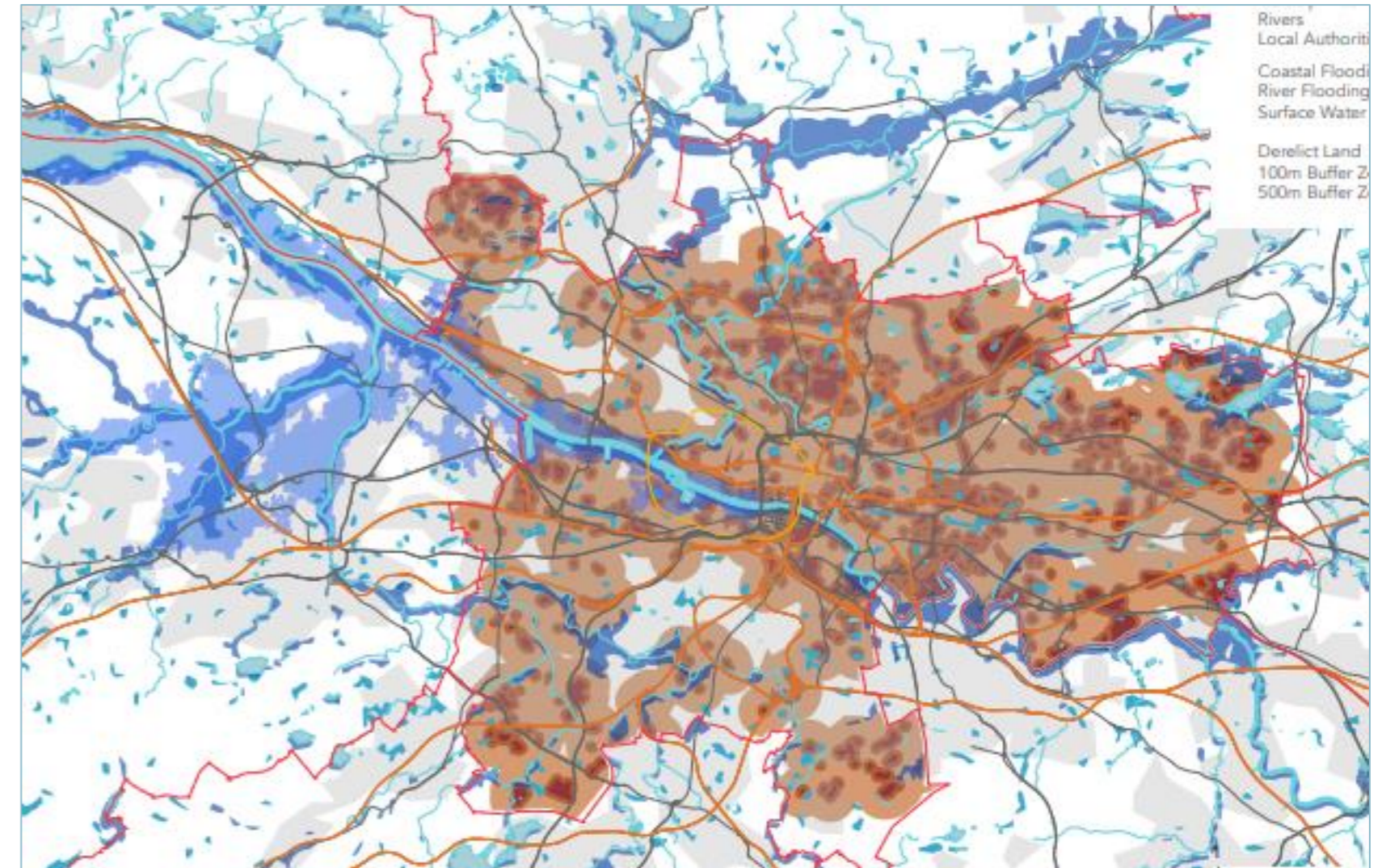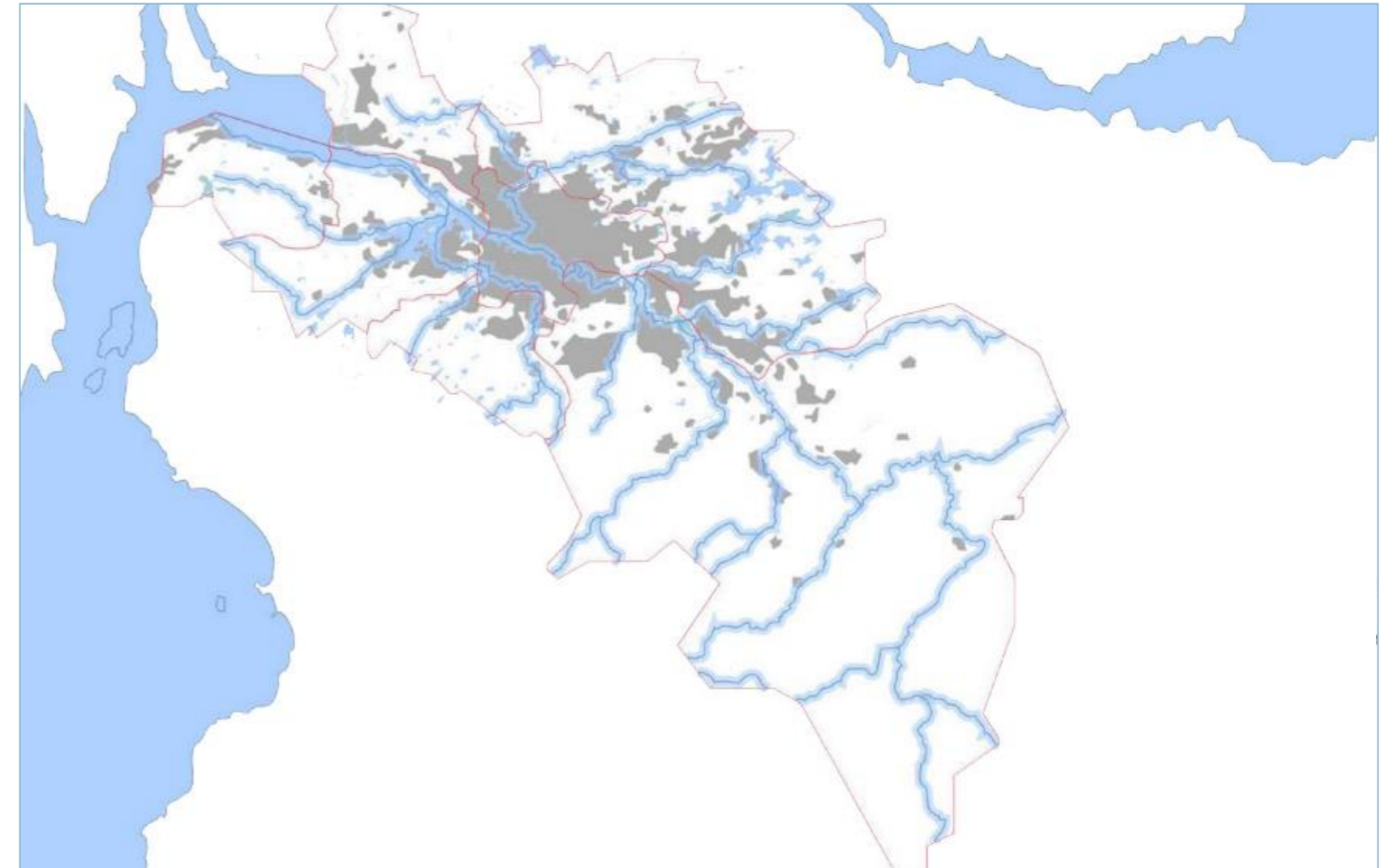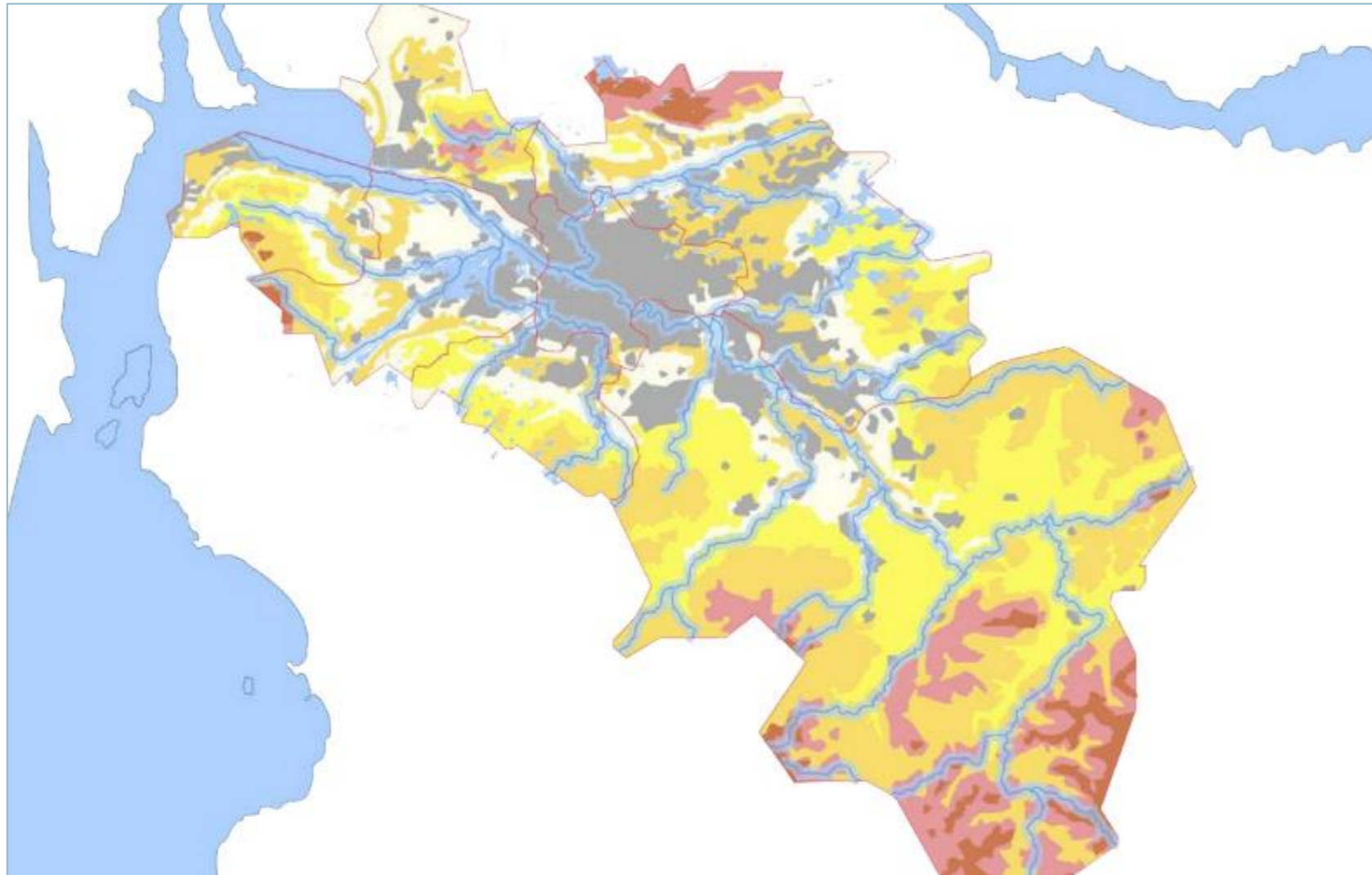
Increase in jobs + flood zones: One group identified overlaps between zones with an increase in jobs, and zones with predicated flooding (west of city centre), and questioned what might incentivise (both financial and social value) or encourage new development to be resilient and sustainable.

Derelict land, social deprivation + predicted flooding: Overlaps between high concentrations of derelict land, social deprivation and predicted flooding were identified as a key set of conditions for strategic intervention, such as in Govan, Drumchapel, Rutherglen and the central city area around the M8, and particularly areas where there are significant disparities in social deprivation within an area, such as in Drumchapel.

Social deprivation, lack of greenspace + predicted flooding: Another group looked at areas that face social inequalities, lack of greenspace and were at risk of flooding, and focused on the local canals as opportunities for rehabilitation and creation of high quality greenspace for 'smart flooding' strategies, building flood resilience while improving wellbeing outcomes for the local community.

Economic centres + transport corridors: Glasgow's centralised business district is not for ever, but determines commuting transport. One group identified the existing transport corridors as being a key site for strategic intervention, and an opportunity to focus on quality of place, legibility and experience along these corridors and at key transport nodes. Lack of economic activity and transport connectivity was also identified as an opportunity to locate new economies within the grain of the neighbourhood, where commuting isn't necessary.

Social deprivation + youth: Although not provided in the mapped data, one group centred on investment in youth as an important focal point for strategic intervention, particularly building capacity around schools and families in areas where infrastructure planned is perceived to be failing, such as York Hill,

Partick and Govan. The group also looked to examples like the East end at Clyde Gateway Common Wealth village and Kilmarnock as proof of the impact of prioritising these areas.

River corridors, derelict land + social deprivation: The final key set of conditions identified were the confluence of vacant + derelict land and low socio economic areas that border the river and its tributaries. This was highlighted as an opportunity to future proof neighbourhoods along these water courses, establishing new relationships between the water and the neighbourhoods and establish connections between these different communities.

Right and previous page: Snapshots from the virtual workspace of some of the groups during day 1 of the design sprint.

PRECEDENT: CLOUDBURST MANAGEMENT PLAN, COPENHAGEN

Images: *The City of Copenhagen Cloudburst Management Plan 2012*

To combat the impacts of cloudbursts, the City of Copenhagen developed a Cloudburst Management Plan in 2012, which is an offshoot of the Copenhagen Climate Adaptation Plan. The Plan outlines the priorities and measures recommended for climate adaptation including extreme rainfall. The City carried out an overall assessment of the costs of different measures (traditional vs different options including adaptation measures), the cost of the damages despite the measures and resulting financial impact. It was showed that continuing to focus on traditional sewage systems would result in a negative societal gain: despite capital investments, financial damages from flooding would remain high and not justify the high investment in measure implementation. On the other hand, the combined solution (including adaptation) would result in a net saving. The chosen combined solution will consist of expanding the sewer network and around 300 surface projects focusing on water retention and drainage.
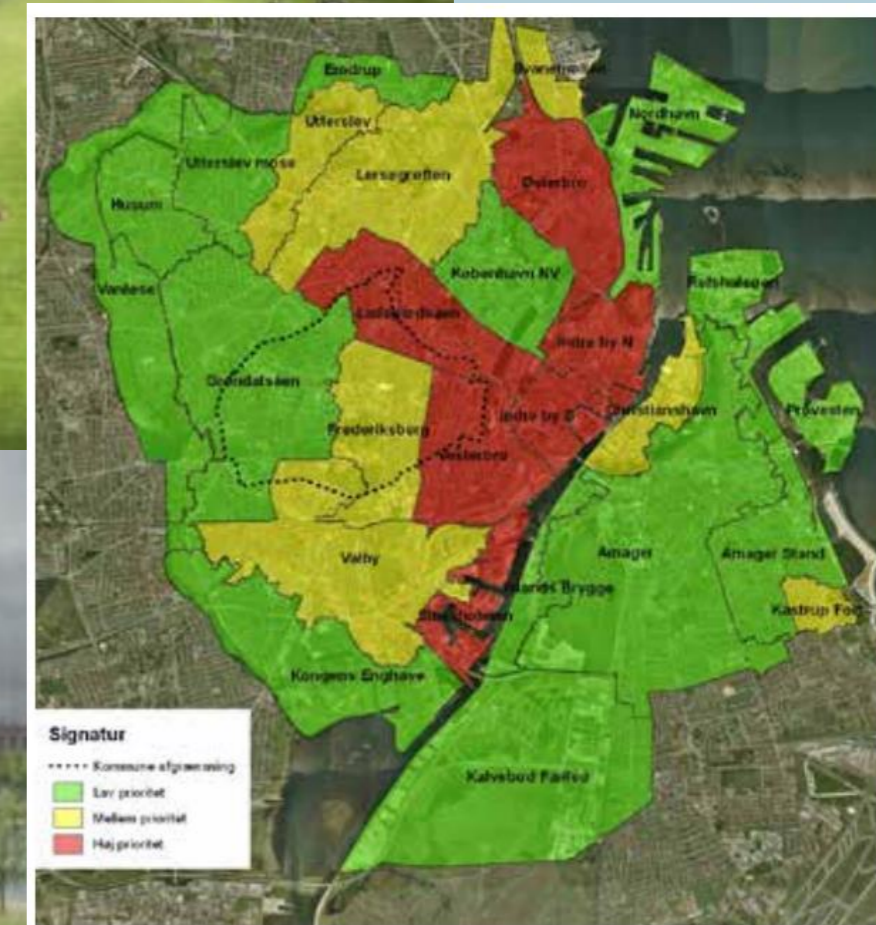

FIGURE 3 // PRIORITISING ADAPTIVE MEASURES
The map shows the priority of measures in the water catchment areas of Copenhagen – at three levels according to risk, implementation, and synergistic effect with urban planning and development projects.

DAY 1 SUMMARY
DEDUCTIONS & DIRECTIONS

Day 1 summary

In six uplifting sessions on Day 1 participants contributed to wide-ranging discussions and rich debate on a fascinating range of issues, framing the systemic challenges and opportunities faced by the Glasgow city-region.

There is tendency in many cities throughout the world to think about issues in a disaggregated way. Systems thinking is a meaningful discipline for pulling all these different strands together such as the multi- hub model introduced in the introduction.

The discussion in groups covered a wide canvas, e.g. the danger of thinking around some 'ideal' future rather than starting from where we are at the moment. Across all the groups came a clear message for a need to think comprehensively around the big challenges that are here now, that cannot be ignored and that present challenges at a scale beyond the everyday ones that are always present and that endure. But our challenges have become bigger and scarier.
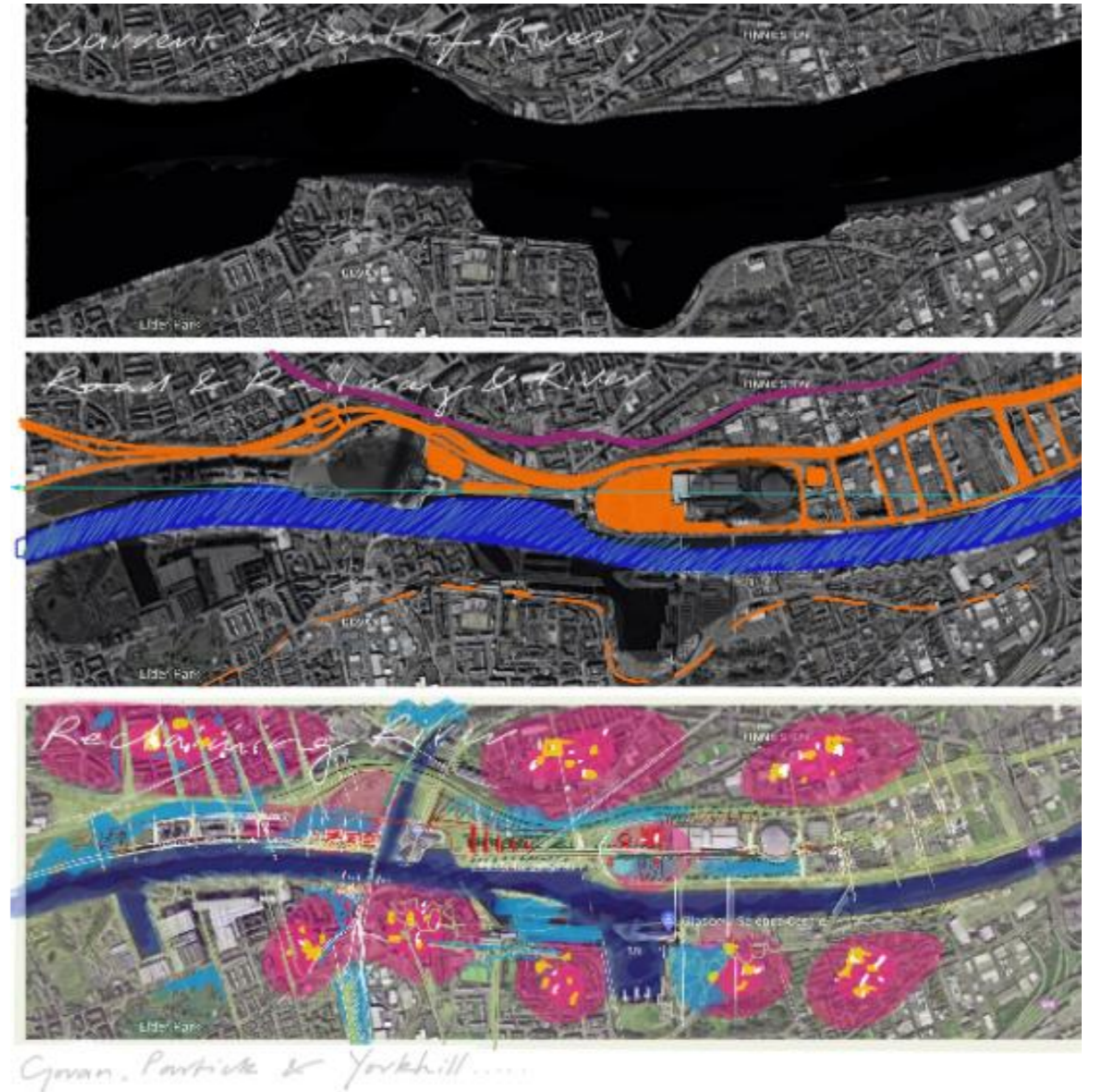
Colleagues' work today has reinforced the need for balance: on the one side the need for equity in responding to intense levels of deprivation in some areas, the drag this creates for those who suffer as a consequence, and for the city as a whole. On the other side there are new strategic challenges that cannot be ignored as climate change accelerates.

The potential for extreme weather and consequential flooding and the challenge of decarbonisation could have major effects and need to be tackled at scale. The changes these require might go beyond the local and incremental responses and demand systemic approaches. These challenges have been accelerated by the pandemic but have not been caused by it. They beg the question: is there a new city waiting to break out, with new economies, new social models and are there new approaches waiting to be deployed to help address the systemic challenges we face.

As one of the groups put it: that it is not just a city-region challenge but a Scotland-wide challenge with Glasgow at the epicentre of that challenge. There was an appetite in the discussions to seize the opportunities presented by the pandemic crisis.

Many commonalities giving birth to interesting approaches came through from each of the groups: such as when to intervene … and how? Some questioned whether the need for systems thinking at the regional level may be too difficult or too great to resolve. Some favoured the local, human and incremental approach, others embraced the need to turn and face the challenge, and to do so at scale. This is one of the dilemmas that the second part of this work needs to address.
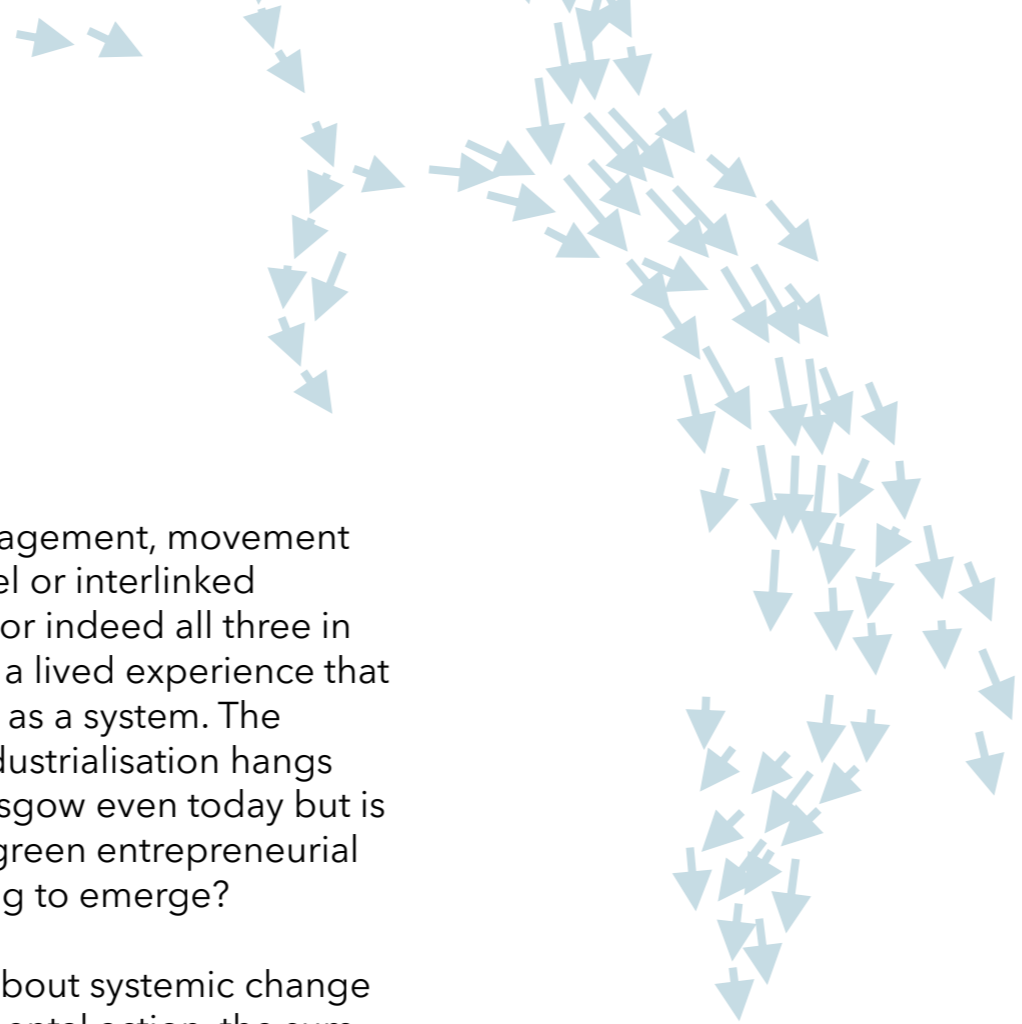
Is the city centre challenged by the changes it faces as a consequence of the pandemic? How do we maintain it, how do we renew it and how do we recognise some of the central functions are dispersing to smaller communities and smaller neighbourhoods across the city? Perhaps a focus on corridors and strategic spaces creating a network of strategic nexus points across the city region with many interesting locations bubbling up in the work.

Discussions considered corridors of understanding and physical corridors for action. Whether directed to water or transport corridors can they start to present opportunities for conjoined system to aggregate small interventions together to effect positive systemic differences in people's lives. Whether around flood and water management, movement and active travel or interlinked greenspace … or indeed all three in order to create a lived experience that works – the city as a system. The legacy of deindustrialisation hangs heavy over Glasgow even today but is there is a new green entrepreneurial Glasgow waiting to emerge?

Can we bring about systemic change through incremental action, the sum of small things or, is the whole really greater than the sum of its parts? We can and do make a change through localism, they do make a difference at the community level. These are important, they must continue, they are necessary, but are they sufficient to address city-region challenges. Can they provide a blueprint for transforming cities at the speed, scale and cost that can be afforded?

Emerging themes:

Risk of focusing on the now: where we are, how we find ourselves.

The scale of working and how disadvantaged communities are given agency to contribute.

Enabling communities to help upgrade the 'health' of the regional system.

The city was scarred in the past, but it was not the people of Glasgow who scarred it.

The tributaries of the Clyde touch all the communities of the city region providing a network of water neighbourhoods... if only we could see it.

A palpable sense that a new Glasgow is waiting to break through

A collective will for behavioural change.

PRECEDENT:
SEA-DEFENCE SYSTEM, HAMBURG

Located at Niederhafen, on the Elbe River between St. Pauli Landungsbrücken and Baumwall in Hamburg, the upgraded 625 m river promenade is integral to the modernization and reinforcement of the city's flood protection system.

The design for the redevelopment of Hamburg's Niederhafen flood protection barrier reconnects its river promenade with the surrounding urban fabric of the city, serving as a popular riverside walkway while also creating links with adjacent neighbourhoods.

Photograph: *Piet Niemann*

Photograph: *Peter Yeung/Bloomberg CityLab*

DAY 2
INTERVENTIONS & ACUPUNCTURE

On Day Two, the groups then generated propositions for interventions as acupuncture at strategic sites or conditions they identified in Day One.

The key strategic moves proposed by the groups in Day Two were:

1. **The Heart, the Lungs, the Nervous System**
2. **Community Spring Boards**
3. **The Blue Belts of Glasgow**
4. **A Murmuration of Future Edges**
5. **Water Institutions**
6. **Water Neighbourhoods**

Each of these propositions are summarised in the following pages, as are the set of conditions that each idea responds to (identified in day one), and any precedents reflected on or referenced.

Alongside each of these summaries is also a snapshot of the visual exploration and ideation carried out by each of the groups during the design sprint.
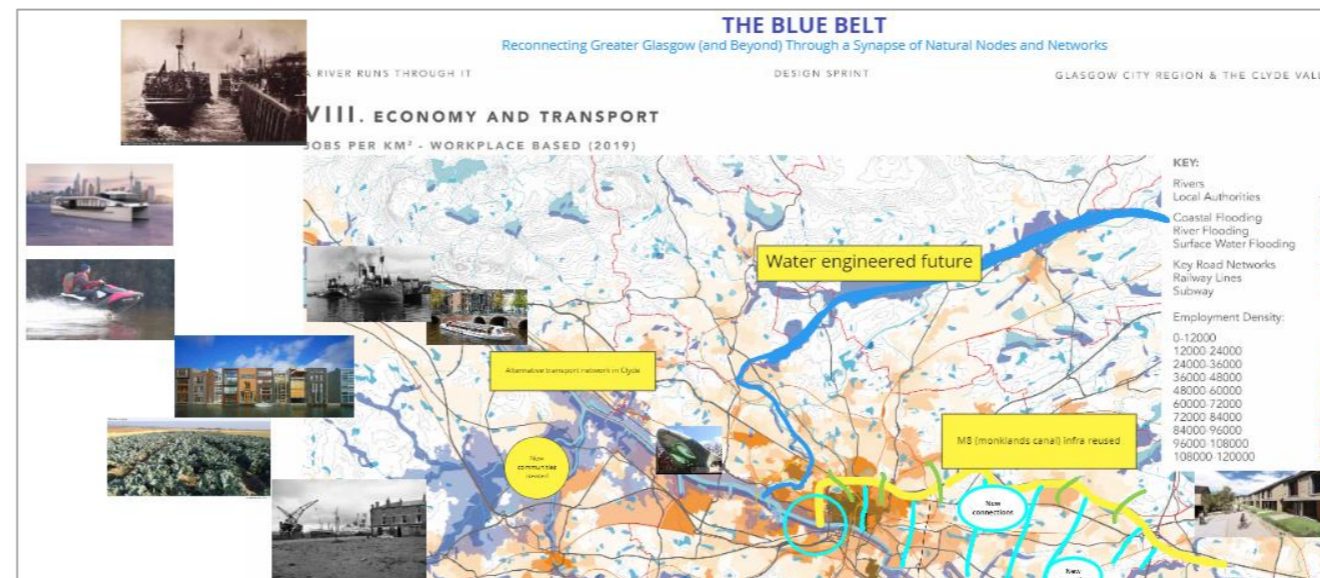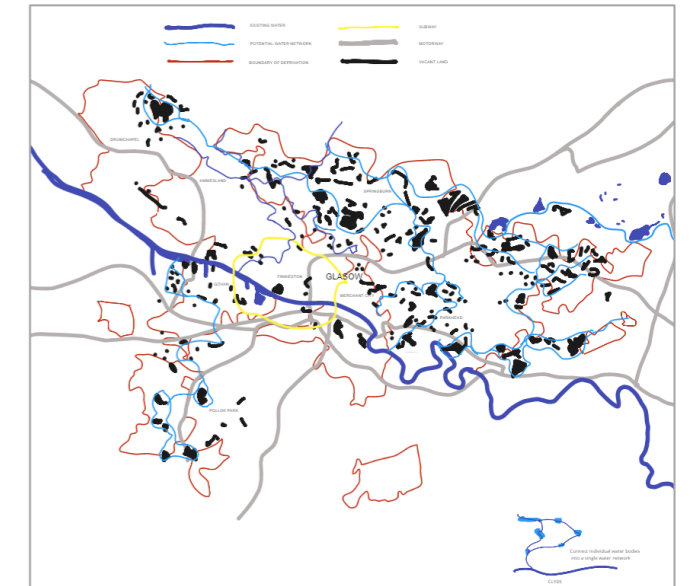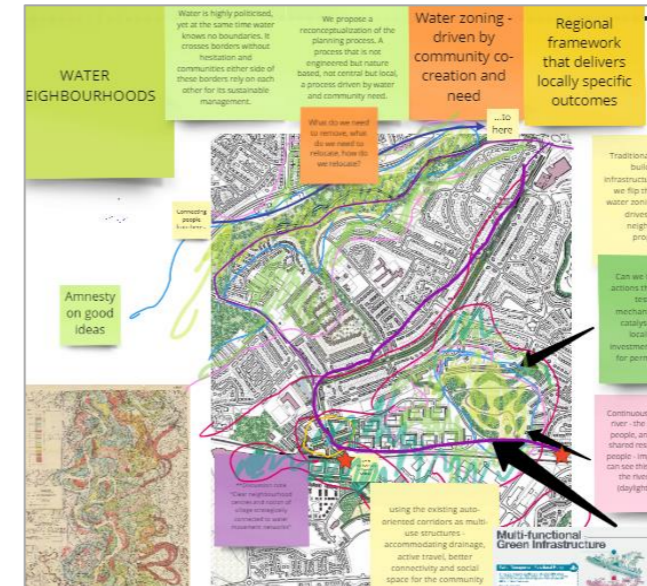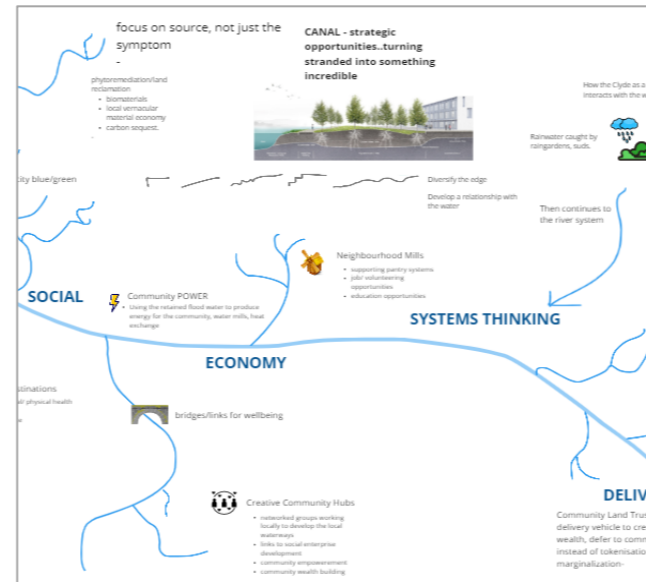
The Heart, the Lungs, the Nervous System

Conditions: Green space; topography; flooding.

Proposition: This proposed intervention advocates for the repositioning of the Clyde as a public asset, and centre planning and development of the Clyde for public good.

The group discussed how to scale up the work of community groups and the idea of the Clyde as a Nervous System, a Heart, and other bodily analogies.

The group realised the importance of not just considering the Clyde itself but considering its tributaries and the full system to the uplands and coast. Viewing it as a network, they imagined it as the nervous system of your body that effects the city's health, social life and climate.

They considered how the nervous system sits in a sponge like it fits in the tissues of your body.

Within our body we have multiple systems that need to interact to work. The entire catchment is the equivalent to one person and where you impact one thing you have an influence on another.

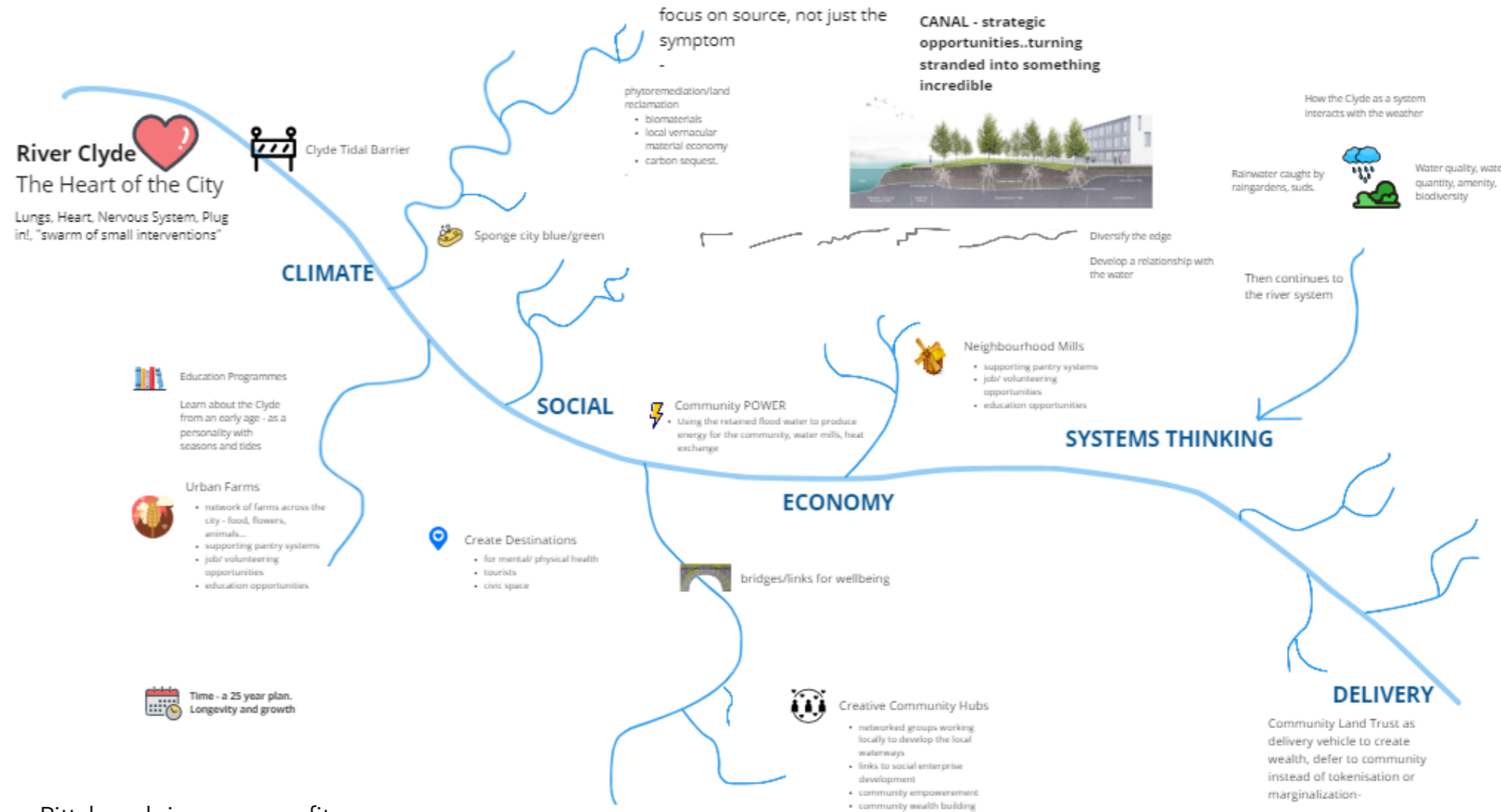Thinking of Clyde as the heart of the city what is fed into it and how it keeps healthy. They discussed that the longevity needs to be 25 years so that primary school children will grow up and see the effect of decisions made.

Precedents: In 2017 the Whanganui River in Aotearoa New Zealand was granted legal personhood to give it legal rights. The City of Calgary's Utilities and Environmental Protection Department have been incorporating art in their projects since 2007. An example of a potential governance model is *Riverlife,* formed in 1999 in

Pittsburgh is a non-profit organization formed to lead a community vision for the redevelopment of Pittsburgh's downtown riverfronts.

River Clyde ♥
The Heart of the City

Lungs, Heart, Nervous System, Plug in!, "swarm of small interventions"

focus on source, not just the symptom
-
phytoremediation/land reclamation
• biomaterials
• local vernacular material economy
• carbon sequest.

CANAL - strategic opportunities..turning stranded into something incredible

How the Clyde as a system interacts with the weather

Rainwater caught by raingardens, suds.

Water quality, water quantity, amenity, biodiversity

Clyde Tidal Barrier

Sponge city blue/green

Diversify the edge

Develop a relationship with the water

Then continues to the river system

CLIMATE

SOCIAL

ECONOMY

SYSTEMS THINKING

DELIVERY

Education Programmes

Learn about the Clyde from an early age - as a personality with seasons and tides

Urban Farms
• network of farms across the city - food, flowers, animals...
• supporting pantry systems
• job/ volunteering opportunities
• education opportunities

Time - a 25 year plan. Longevity and growth

Community POWER
• Using the retained flood water to produce energy for the community, water mills, heat exchange

Neighbourhood Mills
• supporting pantry systems
• job/ volunteering opportunities
• education opportunities

Create Destinations
• for mental/ physical health
• tourists
• civic space

bridges/links for wellbeing

Creative Community Hubs
• networked groups working locally to develop the local waterways
• links to social enterprise development
• community empowerment
• community wealth building

Community Land Trust as delivery vehicle to create wealth, defer to community instead of tokenisation or marginalization-

Community Spring Boards

Conditions: Flooding; green space; social deprivation indicators.

Proposition: A loose-fit framework to encourage, facilitate and unblock grassroot initiatives. This framework aims to intervene to connect professional services to cultural hubs in communities, providing professional assistance to enable communities with proposals to jump through legal and bureaucratic hoops.

The key theme that ran through the group's ideas was improving connectivity. They first thought about improving physical connectivity by improving green space, opening up culverts and connecting people back to the water. They realised the importance of embracing the water by turning the problems it causes into something beneficial for the community, such as wetlands.

For some communities the connectivity might be around food; growing food, community food gardens, food education and food businesses. These initiatives lead to interconnected communities with a more even distribution of wealth, improved public access to public land and connectivity to infrastructure.

The group discussed that although community engagement is already happening, there's a requirement for more than engagement that will enable the great work of local communities to develop. Communities already have art, heritage, culture, music and food initiatives but the difficulty is growing and connecting these ideas Therefore there's a need for a long term framework and structure to be established to support communities.

Precedents: Seeds to Solutions is about how food growing/sharing has transformed neighbourhoods and improved sustainability.

The Blue Belts of Glasgow

Conditions: Transport networks; rivers; economic centres; vacant and derelict land.

Proposition: Like many of the other groups, Group 3 reflected on the impact of the M8 on shaping the city, and looked to this not only as a focus for critique/change, but as a kind of source of inspiration, in terms of the scale of impact.
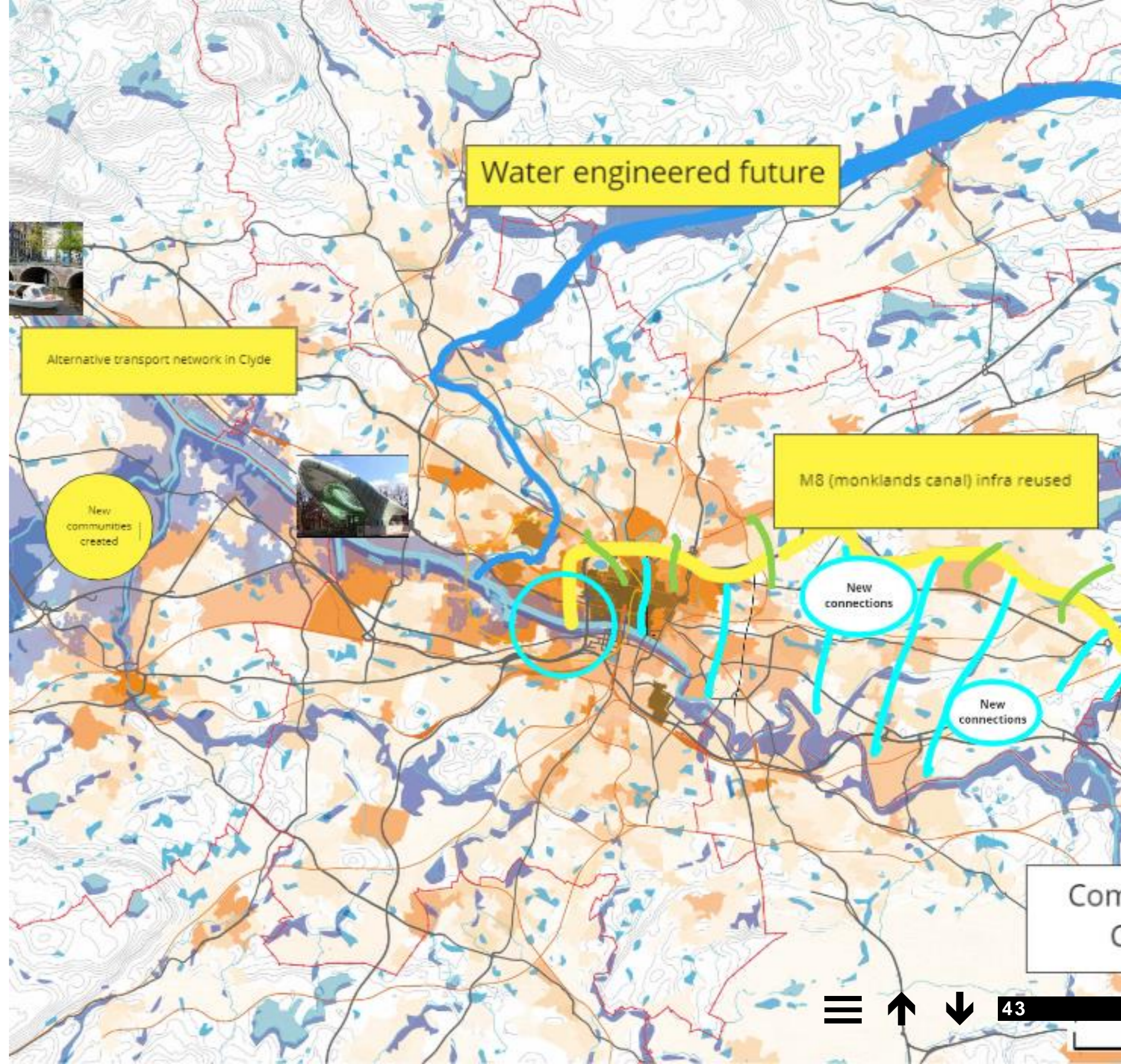
This proposition - which builds on ideas developed at a recent design sprint hosted by Urban C:Lab in Edinburgh – proposes to reinstate the canal between Edinburgh and Glasgow, reusing the M8 infrastructure for surface water and tidal canals.

The new canal would establish a modal shift for transport in the region, introducing water-based transport like electric river taxis in an effort to move towards sustainable mobility, with a focus on quality of experience. Even a traffic jam on the water beats a traffic jam on the motorway.

This new water transport system centres on connecting communities and aims to diffuse the concentration of traffic with a kind of messy connectivity that reflects the inherent messiness of community fabric, with minor canals that spur off into and through disconnected or underserved communities like Cart in the South and Monklands, but also those with vacant and derelict land with the potential for housing, reaching out to Lanarkshire and beyond.

Precedents: Innsbrook Metro system; OceanSpan

Water engineered future

Alternative transport network in Clyde

New communities created

M8 (monklands canal) infra reused

New connections

New connections

A murmuration of future edges

Conditions: Derelict land; roads, transport networks; rivers; flooding; social deprivation indicators.

Proposition: 'A murmuration of future edges' is a proposition that reflects on the introduction/imposition of the motorway as a rupture to the city in need of suturing.

As with many other of the groups, Group 4 also sought to reframe people's relationship with the water, and bring a greater awareness of the nature of the river and its tributaries, including the changing tidal level, development and connectivity potential

Tracing derelict spaces, liminal spaces and road networks, this group speculated on repurposing the roads as canals, introducing a

new transport system. Moving from car-based mobility to a long term system of moving water that connects neighbourhoods, particularly those historically cut off by the underground rail network.

This proposition aims to link these interventions at different scales, in recognition that this is a systems problem, so requires a systems response. This includes water management and productive landscapes at the regional level, repurposing of the roads as waterways at a city level, and activation of these existing and new water ways' edges through minimal interventions and rewilding at the local level, where cocreation of minimal interventions could begin now, in a murmuration of future edges.

Precedents: Utrecht, where the city turned a motorway back to a canal after a public vote.
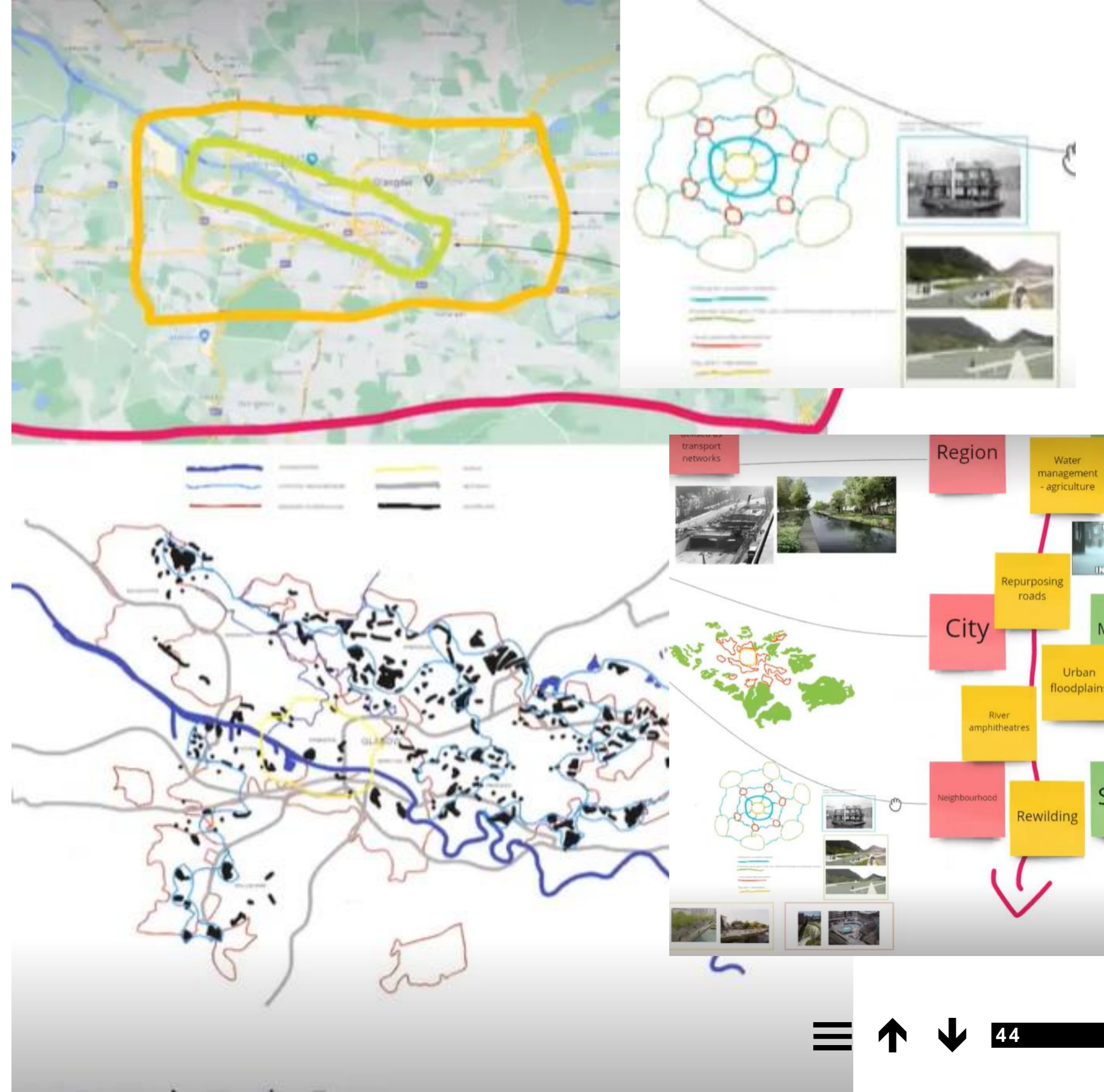
Water institutions

Conditions: Flood zones; projected flood risk zones; governance boundaries (geographic and functional); economic centres.

Proposition: Group 5's proposed strategic intervention was to establish 'Water institutions', to focus planning and governance on developing proactive and positive Scottish waterscapes and a new water economy, nationally, regionally, locally. Rather than consider flooding as a threat, this proposition aims to reimagine flooding as an asset and an opportunity for the city and communities along the water corridor.

This new water institution would look at areas where flooding is identified, and flood more, redefining these spaces as destinations and managing the surface water at source before it gets into the river,

reimagining these as positive new use classes and aiming to reduce the risk associated with flood and perceived risk of investment.

'Water institutions' would be supported by connected, integrated water infrastructures and other city mechanisms, to drive a new form of water economy around positive water development.

The group also proposed to deregulate certain parts around the catchments areas to allow communities and individual to try different approaches to water development and encourage codesign practices.

Precedents: This proposition to formally reposition flooding as an asset draws on precedent projects including Claypits by Scottish Canals Trust and Room for the River, Nijmegen.

Green infrastructure - utilise this as a benefit - health & wellbeing, biodiversity, urban cooling, claypits etc

Urban network - connect the centre system to the regional system
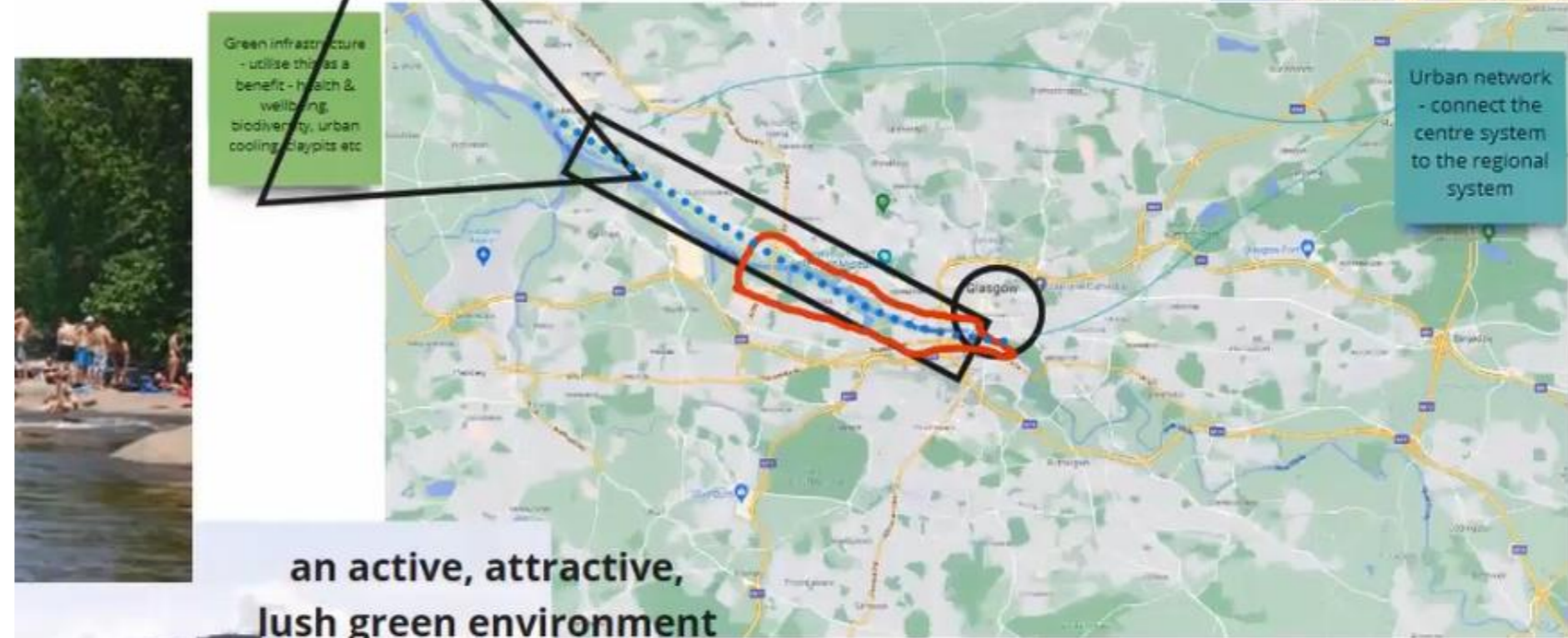
an active, attractive, lush green environment as heart of the city-region

Water neighbourhoods

Conditions: Vacant land; Local authority boundaries; Projected flooding (e.g.Nitshill, and replicated throughout other similar locales)

Proposition: 'Water neighbourhoods' is a proposition to re-center and re-zone planning on the river and its tributaries – from the source down to the Clyde - as an active recognition that water courses do not observe planning boundaries, and repositions this fact as an opportunity, rather than an obstacle.

By reimagining locality around the waterways and encouraging cross-boundary collaboration between neighbouring communities, 'water neighbourhoods' aims to radically localise the visioning and planning of the areas alongside Glasgow's tributaries, redefine citizens' relationship to the waterways and enable cross-cutting and integrated sustainable management, to achieve cumulative and connect impacts.

Precedents: The group looked to precedents of waterway-based planning along the River Nile and Pondicherry, and also reflected that this proposition builds on many other similar ideas over the years, and posited that the city would benefit from revisiting some of these previous propositions.
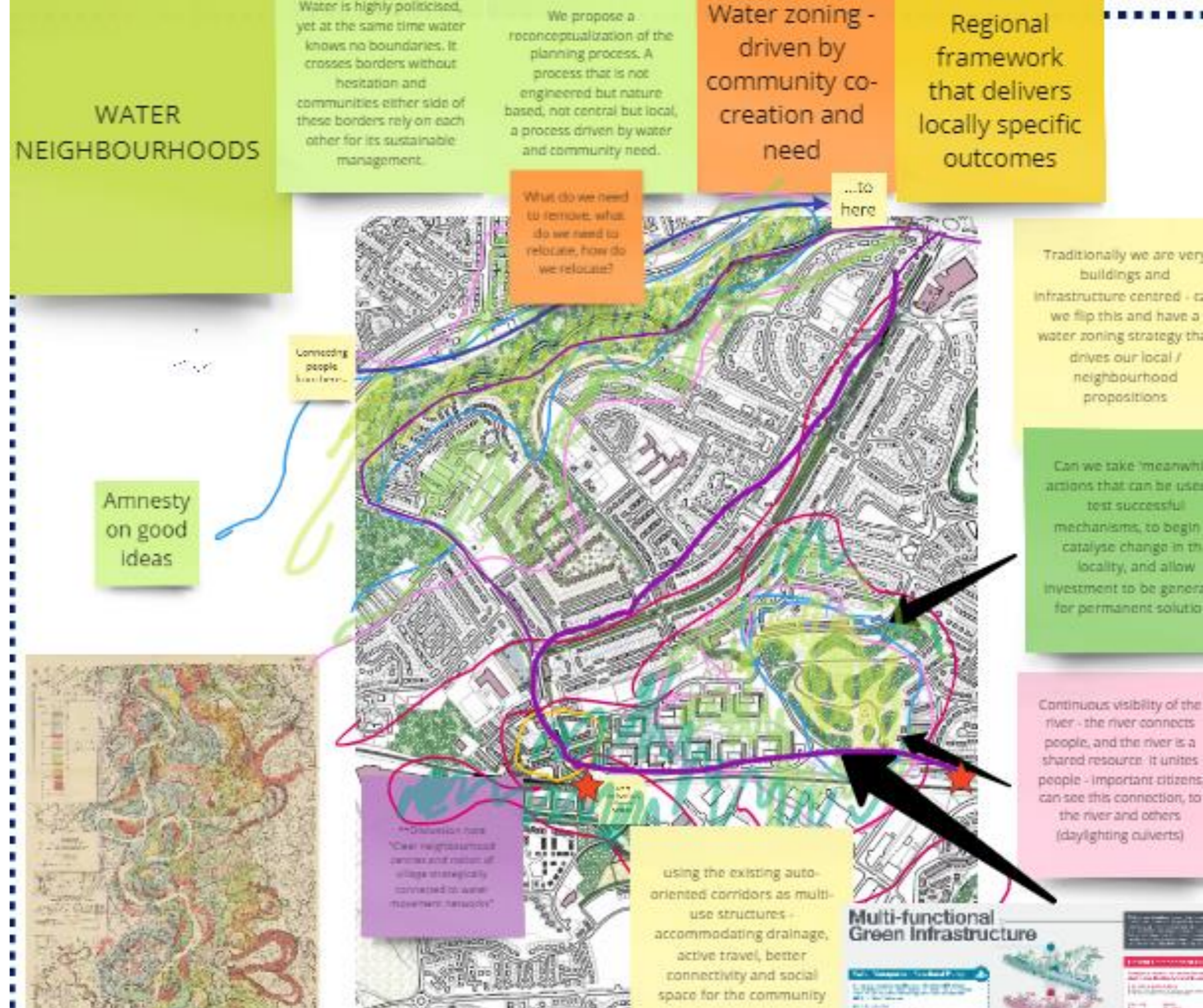
PRECEDENT:
KIRKKOJARVI FLOOD PARK
ESPOO RIVER VALLEY

+3,5 MSL

+4,0 MSL

+4,5 MSL

+5,0 MSL

Kirkkojärvi Park is a green oasis in the Espoo river valley in Finland. The project centres on the dynamic movement of the water and sculpting the ground. The former lake that was at the area was brought to the landscape as a symbolic, open flood field. The lake returns to the landscape when the river floods.

Images: Pyry Kantonen Photography and LOCI Landscape Architects. Words: LOCI Landscape Architects

DAY 2 SUMMARY
IMAGINED IDEAS & EXPECTATIONS

The second day generated a rich set of discussions, insights and creative thought. There has been a very clear take up of the systems brief that was set at the outset with all participants engaging with the overall system and recognising that the River needs to be dealt with on a regional scale where connectedness is key.

One of the most striking insights was to recognise that **the River system is a massive and positive asset for the City and the Region** - a clear challenge to conventional thinking.

This very positive proposition provoked concepts around a Clyde water landscape to be backed up by thinking at the right scale, with the right connectedness and the right institutional framework, to create a regional space and a connected series of places.

Many of the groups captured the essence of systems thinking, summed up in one group's reimagining of the River network as the nervous system of the West of Scotland. This analogy challenged us to understand **the River network as a properly connected system** - connecting communities and places, up and down the river and along tributaries and into neighbourhoods -- a central blue belt of connectivity from the Clyde into the wider region and beyond.

Taking this perspective, it becomes clear that **interventions must be at the scale of the system and carried out in a holistic** way. A systemic response at scale to a systemic challenge at scale. Rather than looking for 'mega project' interventions, many of the groups an aggregation of projects, at the scale of the community, might enable greater community

participation, faster implementation and ability to test and scale ideas. This was expressed by one group as a 'murmuration' of smaller projects, with a coordination mechanism for many interventions multiple scales where the collective whole is greater than the individual parts. This takes the thinking of the murmuration projects at a community scale, as a complementary group of interventions, with a bottom-up and co-created ethos, with a blend of multiple intervention types and scales, within a framework of coordinating principles.

Thoughtful reflections within groups realised that to address major rain fall and major tidal surges at scale, there will also need to be some big projects at a regional scale. Although this could be through creating productive

landscapes as much as large engineering works with climate costly concrete megastructures – think polders rather than the Hoover Dam as one participant put it – and instead, many smaller actors working collectively might create at scale impact. And a similar approach could be adopted away from the River working with water neighbourhoods along tributaries in the city and in neighbouring towns.

A number of teams put forward the idea that intervening in city networks to create different and transformational ways of integrating water into the city, the way that movement occurs, starting to look at our big road corridors and other monofunctional infrastructures, starting to migrate them into a role in a network of blue green infrastructure within Glasgow and surrounding towns to create interconnectedness between neighbourhoods with a

realisation that a much of this could occur at small scales – neighbourhoods – but with significant and transformational impact. Greening the core of Glasgow, greening neighbourhoods and greening towns by a network at water neighbourhood scale to engage communities with green space at the community level recovering landscapes, recovering interactions with water and enabling and empowering communities to push things forward on their own account.

With this thinking around a murmuration of projects level it becomes possible for different ideas to come forward and in many different ways, through co-creation with projects moving different speeds but, with institutional support, working from the small scale through outward connectivity

to link individual communities together. Making space for water at the community level really comes into its own when it starts to deliver network connectivity, that encourages movement and connectivity between neighbourhoods as well as encouraging connectivity outer districts to the city centre.

Overall, a very rich discussion around intervening at a systemic level at both large and small scale and in a connected way.

Firstly, the challenge of dealing with the concept of flow when working with cities. Secondly the concept that the River has rights too, a strong and potent proposition. And of course, as well as water the other flow that is all pervasive – the movement and traffic flow and how these flows have a huge impact on every city.

Throughout these discussions there was a real sensitivity to place because the group of people participating in the sprint have a real feel for Glasgow's places and communities and that was a rewarding aspect of the work that transcended administrative boundaries and divisions and technical challenges.

Thanks to all, for valuable insights and parables on delivery such as the parable about macro and micro thinking and the challenges the Netherlands have faced with flooding and what that's done to promote nature-based solutions. It was rewarding that everyone embraced the proposition around systems and systems thinking in

design, in planning, in engaging with communities and how we introduce everyone to that.
This immediacy of thinking, the proposition of a murmuration of projects - urbanism by murmuration. How can that be brought about? A very rich, very full, very valuable discussion.

Hopefully, some of this thinking might inform the Clyde mission or the next generation of development plans with a lot of rich material about place, place in Glasgow and communities in Glasgow with some strategic propositions and some strategic principles around about water communities that might start to bring things together.
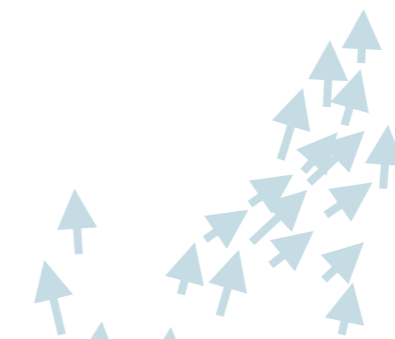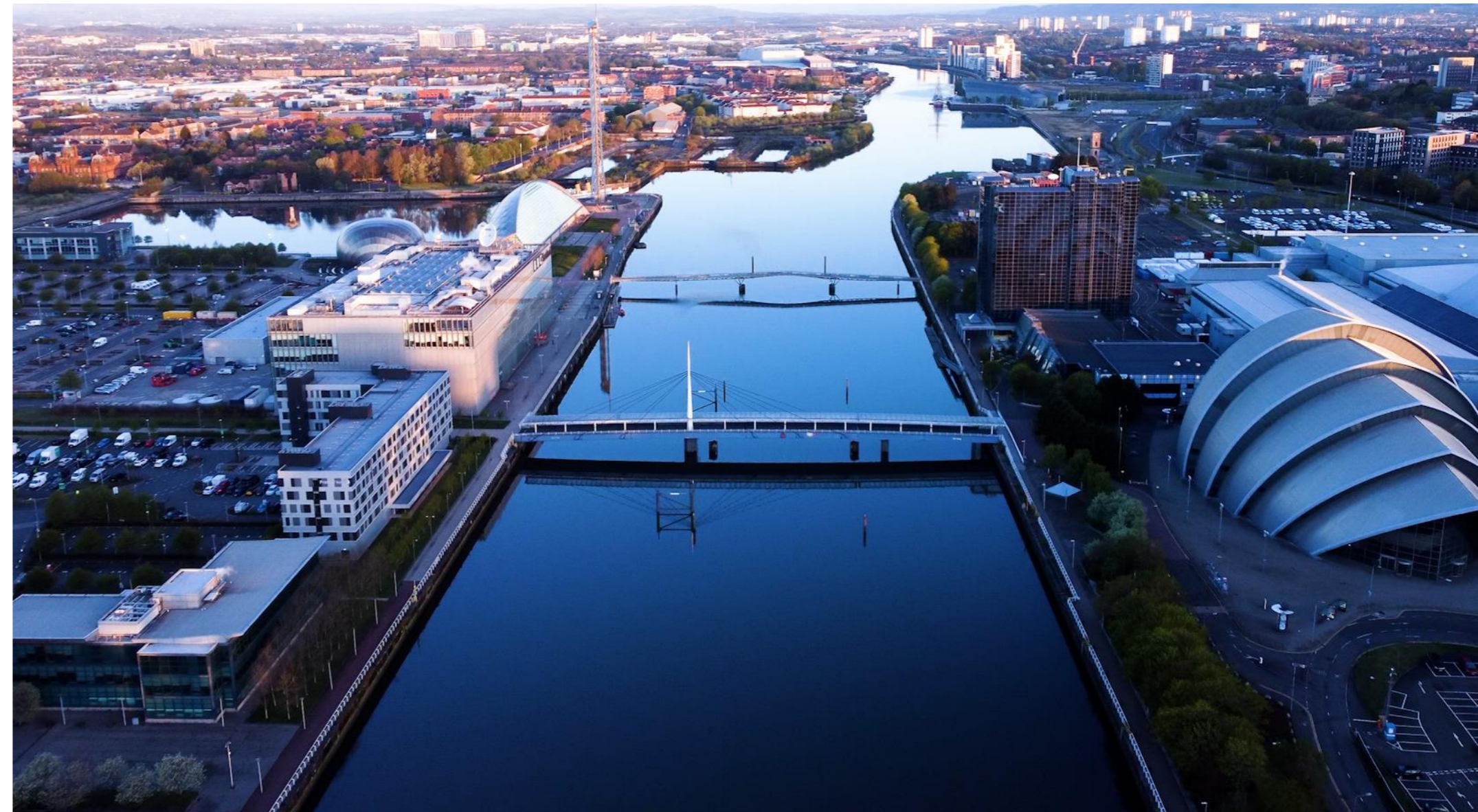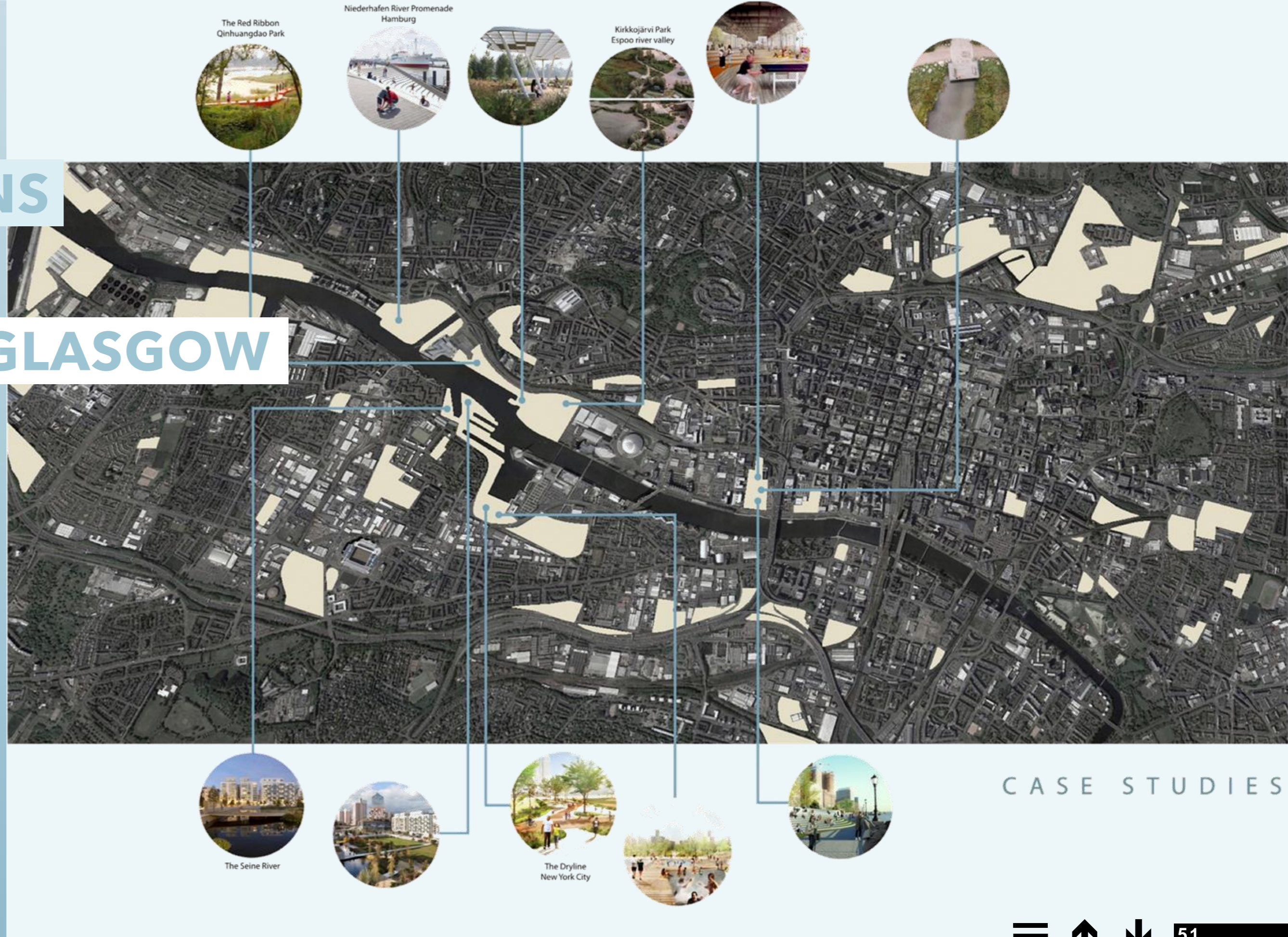
PARALLEL EXPLORATIONS AT THE MSA
IDEAS MAKE GLASGOW

At the same time as the work of the design sprint was taking place, the students from the Mackintosh School of Architecture, who contributed analytical drawings to help the event, continued with their design enquiries into the River System in the Glasgow City Region.

They have kindly shared their design enquiries and ideas and these are illustrated in the subsequent pages under the headlines "Ideas make Glasgow Green" and "Ideas make Glasgow".

The Red Ribbon
Qinhuangdao Park

Niederhafen River Promenade
Hamburg

Kirkkojärvi Park
Espoo river valley

The Seine River

The Dryline
New York City

CASE STUDIES
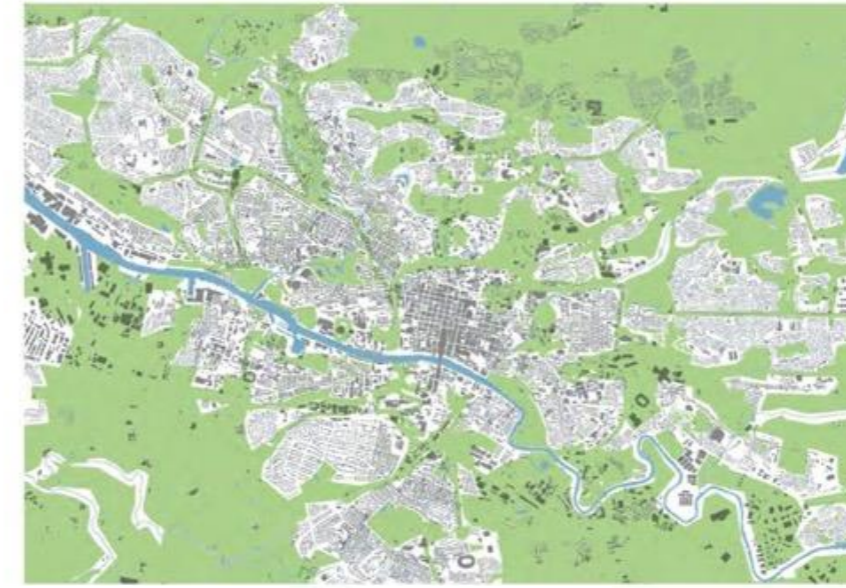
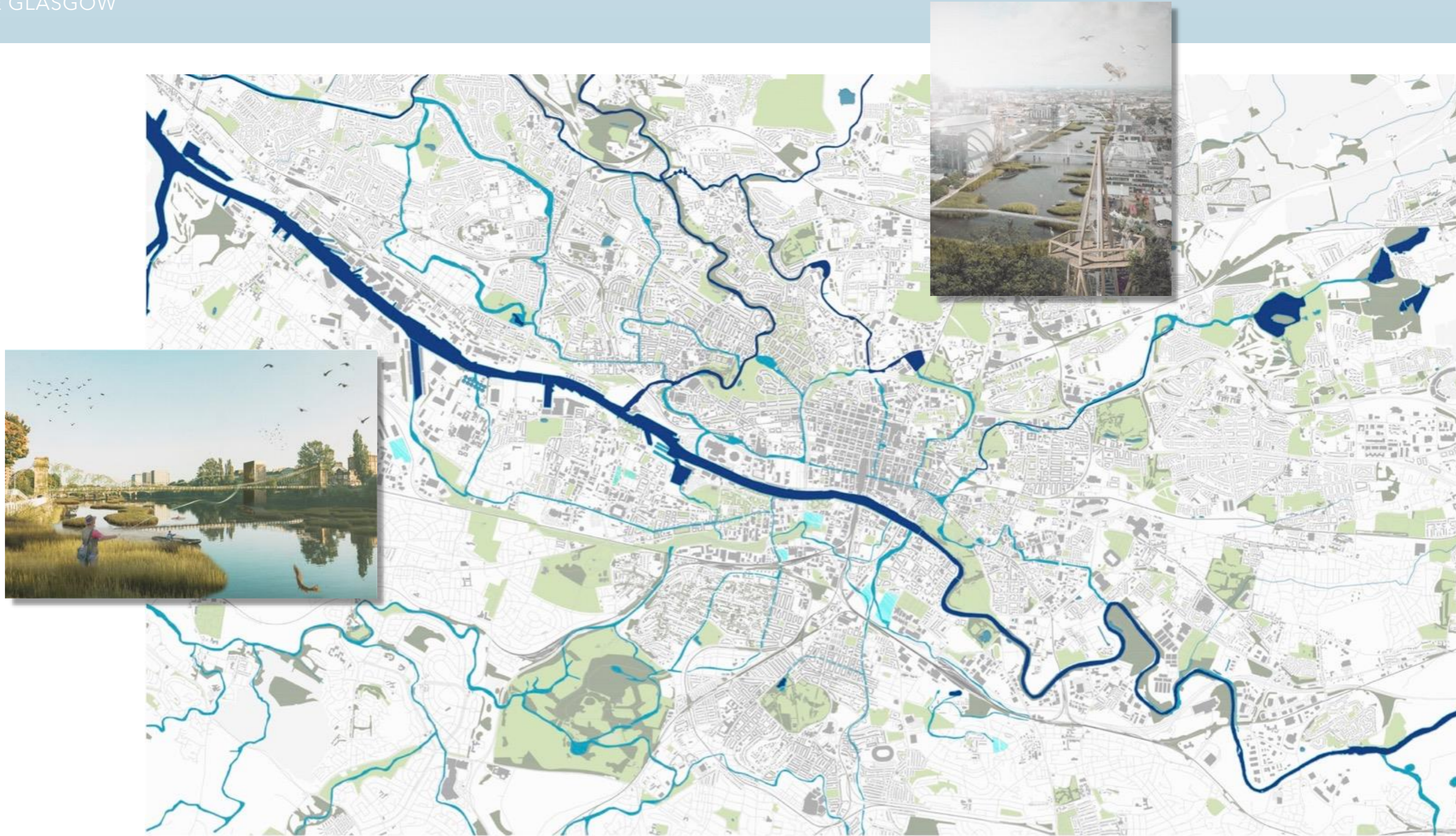MACKINTOSH SCHOOL OF ARCHITECTURE THE GLASGOW SCHOOL OF ART

Glasgow 2020 → Glasgow 2030 → Glasgow 2040

City Park Continuations...

Nature TAKE OVER
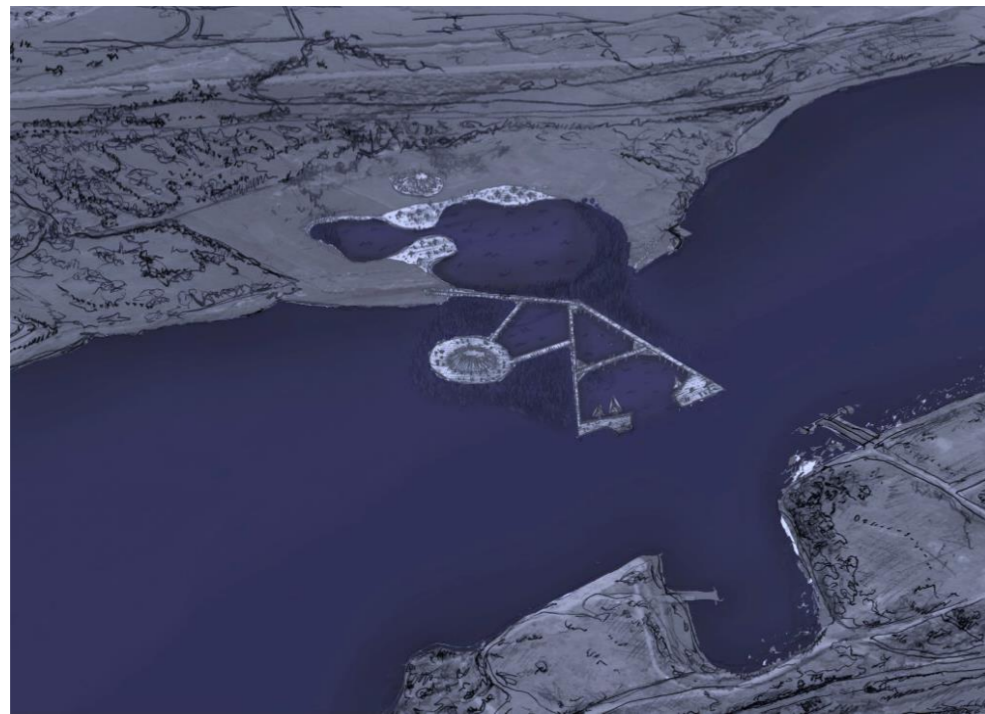
HIGHWAYS
CUT and COVER

URBAN GREENWAYS

CITY-WIDE FOOD
PRODUCTION

RIVER KELVIN

CANAL

CITY OF GLASGOW CULTURE AND NATURE PRESERVE
area of outstanding natural beauty tourist guide map

PARTICK WILDLIFE OBSERVATORY
• marshland delta • swift blind • newt pools •
• birdwatching • historic clutha port •

CULTURAL CAMPUS
• museums • hydro • science centre •
• historic clutha port •

PORT DUNDAS PUBLIC GARDENS
• national theatre • the whiskey bond • canal port •

GLASGOW GREEN NORTH
• the people's palace • nelson's monument •
• doulton fountain • swimming • historic clutha port •

GLASGOW GREEN SOUTH
• public sports grounds • rowing
sheds • jetty • clutha port •

DOCKLANDS MUSEUM
• history of the clyde exhibit •
• history of shipbuilding exhibit •
• history of mercantilism exhibit •
• clutha port •

CLUTHA ROUTE A

RUTHERGLEN FISHING WHARF
• quiet fishing hole • bars and pubs •
• clutha port •

CLUTHA MUSEUM
• museum to the legacy of the
clyde boats • historic clutha port •

CLUTHA ROUTE B

RIVER CART

QUEEN'S PARK
• public sports grounds • cafes •
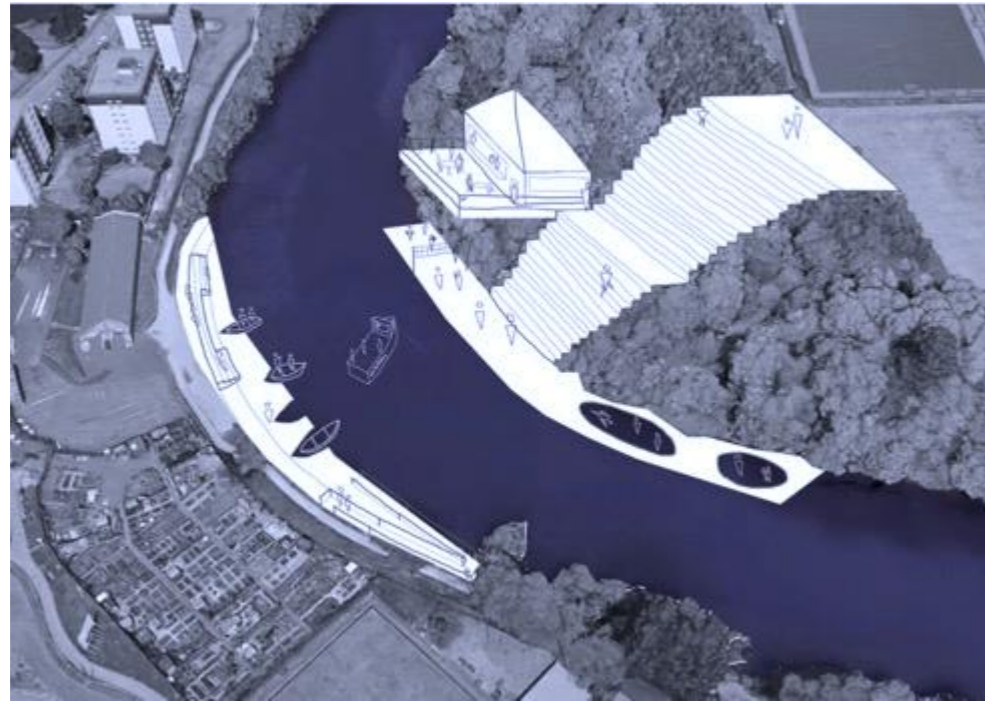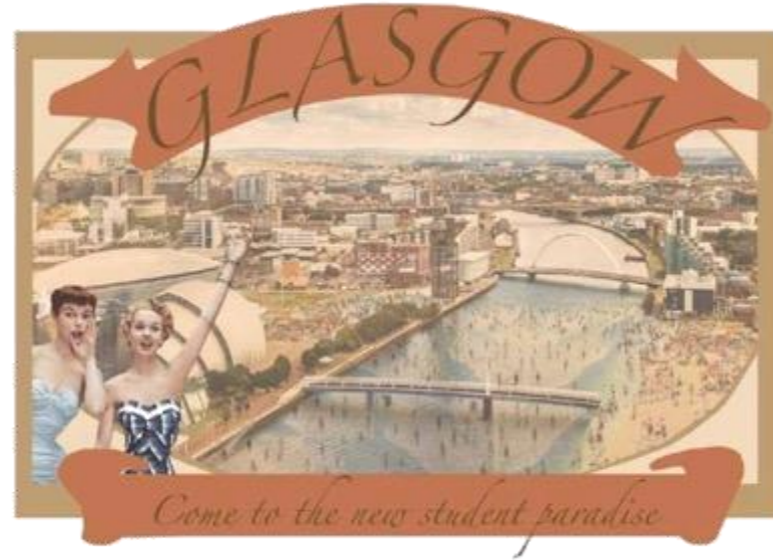• historic glasshouse • canal port •

water & play

reconnection

FEEDBACK & ADVOCACY FOR ACTION

The design sprint team held feedback sessions on this draft document, with a number of key participants including Paul Stallan, Karen Anderson, Jeroen Zuidgeest, Brian Veitch, Deryck Irvine, Rolf Roscher, James Shields, Susan Murray, Heather Claridge and Graham Ross.

Here are some of the takeaways from these rich, passionate and insightful conversations.
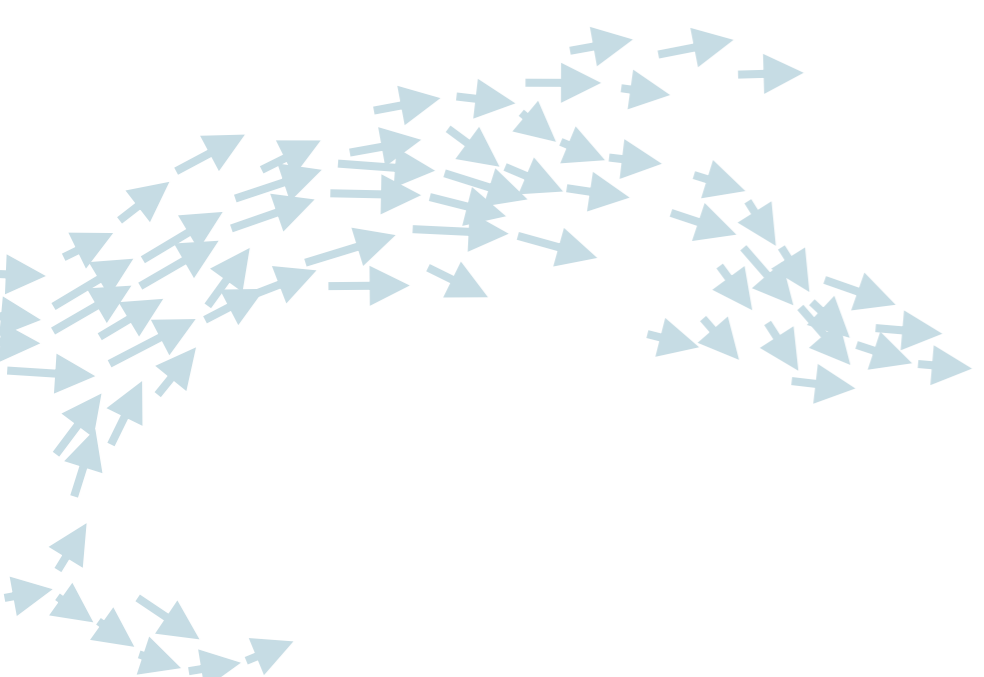
"A really great start on a much-needed piece of wider thinking about the whole Clyde system and indeed other systems within the Glasgow City-Region."

"For anyone trying to get their head around what the water sector in Scotland does, it is reassuring to see work that starts with water as a place asset and not solely as a resource or a problem. Resilience of supply and 'is it going to flood?' are fundamental issues, but not the most creative place to start. Metropolitan Glasgow – the city-region – is there because of the river, and therefore the river system should be at the heart of everything that is going to happen."

"The Glasgow region has not faced the river system in its entirety for decades. Will the new generation of development plans take this thinking on board? Will it inform national planning and the Clyde Mission?"

"Incremental change through aggregation of small actions into big things is risky without significant clear, overall principles. Dialling back and forth between community perspectives and the big system overview is essential to ensure that the aggregation of small changes does in fact add up to something that is greater than a catalogue of small, disjointed projects. The big system perspective must be responsive enough to place to understand that community solutions will not all be the same"

"Draft NPF4 calls sustainable urban green and blue drainage solutions as national development in the national planning framework. If Glasgow is to be a forerunner or a way finder in blue/green sponge city conceptual thinking, it would be great if that was driven by a place vision, not by a technical specification for water management."

"This is a great start, it needs to be turned into a clear manifesto to convince or persuade – whether local people, professionals or stakeholders groups".

"This is timely because it opens the path to capitalising on something that is inevitable. In protecting and developing the Glasgow city-region, we should capitalise on, and make the most of what's going to happen and turn that into, some of the great ideas that are suggested in the document. There is every reason to embrace this thinking nationally, regionally and locally – to be proactive when there is still time and not reactive to impending events."

"Latest thinking such as NPF4 is more holistic in addressing issues around well-being health, biodiversity and poverty and prosperity – the new coming ways of living basically."

"Who owns the Clyde? Is it the people of Scotland people, the world, the people of Glasgow, nobody? Where does the responsibility for governance and stewardship lie?"

"Overarching principles must be responsive to what people feel is locally appropriate without losing coherence of the system."

"The importance of a place approach, as well as a systems approach, and a collaborative approach, as well as a targeted one. The strategic importance of getting people to understand the importance of place led approaches and collaborative thinking. What does it mean to local people in terms of service for them? And so service design, as well as systems design?"

"We need to distinguish between jeopardy and catastrophe and act on jeopardy to prevent catastrophe! Hopeful Jeopardy!"

"By and large, everybody is signed up to place and everybody signed up to collaboration. But I don't come across too much sensitivity to the proposition that you need systems thinking to bring this about. Almost everybody who lives in metropolitan Glasgow is within a 20-minute walk of a watercourse but half of them are in pipes, or are fenced off. It's wonderful that people have embraced the propositions around place - wonderful that people have embraced propositions around collaboration, but we really need to grasp the issues around systems thinking as well otherwise we will let down what we're doing around place and collaboration"

"Where are the challenges and where in these systems do these coincide? The system's approach really needs to run through all of the decision makers, all the silos, all the kind of management, stewardship and governance and this goes that goes back to that point 'who owns this'? If it's not owned, it's not going to happen."

"You cannot address Glasgow's challenges and opportunities within the fence that is Glasgow's boundary without systems analysis and the systems thinking and identifying where the problems and challenges are and where they coincide. Where can change be realised, where it need to happen. Scoping systems thinking and relationship to place in order to think through the next steps, where the further process should be focused and with the right stakeholders - high level, systems scoping, that takes you into detailed areas. It's not only a bottom up process, but it involves co-creation with what is happening at the community level."

"Who are the people who need to think differently, think systems and understand systems so that they can work together to make the links, connect service design and system design delivery for local people. It's not what you think but how you think about the issues around the river system."

"It starts with the shower of rain, or when you wash your dishes - that's when the issue starts. And it's all about capacities of pipes, capacities of surface areas, and all the rest of it. But if you have more water coming up the river in terms of higher tides with sea-level rise, and you've got water going down the river, in terms of in terms of a particular storm event it really doesn't matter what category of engineering it's in - the water all has to end up in the same place - the Clyde - and by definition that's at the lowest point of the city system."

"Local authorities produce development plans, and they're all like little islands, showing the authority in a sea of white paper, because they're not allowed to show what surrounding authorities are showing on their plans. For Glasgow, that's utterly crazy, because Glasgow is surrounded by seven local authorities, each of whom join onto the city."

"You can do as much place thinking as you like, as much community engagement as you can, but you will never, by that alone, get your head around the interaction of all of the systems that take place in metropolitan city - the hydrological, ecological, climatological, logistical, movement systems in a purely bottom-up approach. But you can give people something to think about in terms of the interaction of these different systems within a context of local place and community."

"The next steps need to embrace, challenge and provide Place leadership, governance and partnership, because we've been dancing around projects and interventions and thinking on the bigger scale. But we're lacking the delivery mechanism, the governance that sits behind it, that's missing, we can have as many ideas as we like, but if you haven't got that framework of governance set behind it, it's not going to happen."

SUMMARY

Over the course of the design sprint, a number of key questions and provocations emerged…

A systemic river

What if the Clyde and its tributaries were managed as a whole?

Administrative boundaries don't reflect complex systems like rivers – leading them to be ignored or managed in fragmented siloes.

Viewed and managed holistically, the Clyde and its tributaries can make an enormous contribution to the Glasgow City Region - providing a dense network of corridors simultaneously addressing water resources and flooding, ecology, open space and health, mobility and economic opportunity, inclusion and community integration.

To deliver the most benefit, most efficiently its whole risk and potential needs to be recognised – researched, mapped, communicated, planned, projected, managed – as a system.

A river, a place

What if we understood the Clyde as a place – not just a risk or a resource?

Managing the Clyde as a water resource and as a potential linked flood risk to be managed are essential tasks – but should not be the only perspective that we have on the role of the river.

Most people in Glasgow and the surrounding area live very close to the Clyde or one of its tributaries:

What if we could bring back the river/water courses and their floodable spaces as essential parts of Glasgow place-making?

What if we could make this the dominant image of the city? (and not industrial dereliction or sparkling new assets)

What if these places could provide a core source of value for communities and city economy?
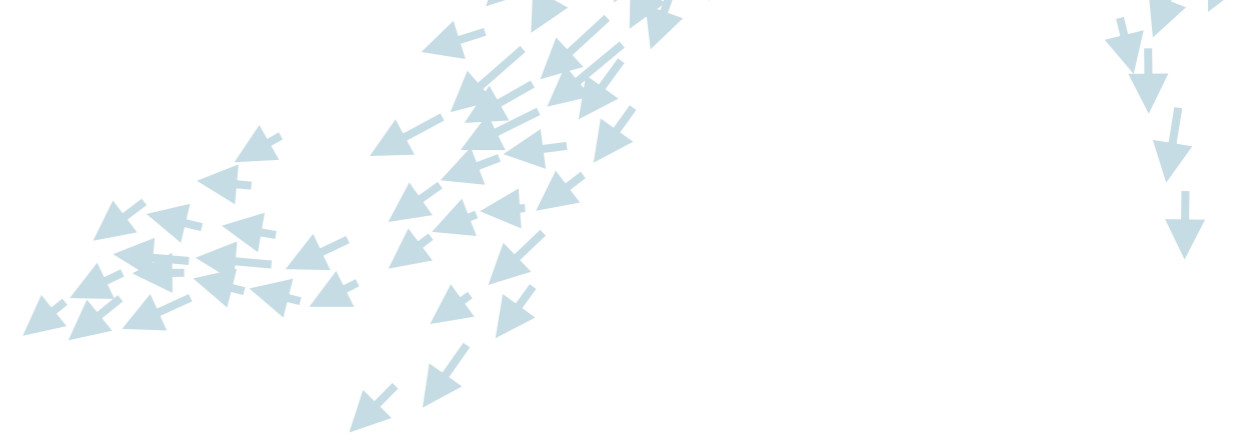
A murmuration of small projects

What if we embarked on a programme of small projects, rather than looking to mega projects?

Very large single projects are vulnerable to disruption – budgets are hard to secure and bottom-up community-led projects can be incoherent at the scale of the city and not lead to change in outcomes.

An alternative approach would be to set up a programme - 'a murmuration of small projects' – aligned in terms of content but shaped in detail, led and funded by different bodies. This could encompass the development of place/community projects at the river margin which improve flood resilience and ecosystem management while creating pedestrian/cycle routes, green spaces and development sites.

This could be a resource for local communities, create longer distance networks for city residents and visitors across the city region, provide a setting and add value for new housing and developments. It's been done elsewhere but the Glasgow City Region could do more.

A river collective

What if all the organisations involved with the Clyde were to come together with one voice?

In a complex system such as a major river, no single person or organisation can have a complete overview – especially where the system crosses administrative boundaries.

Sharing knowledge and coming together to make decisions is critical to successfully managing for resilience.

Could a multi-agency group come together? It might have three tasks:

- *Set a Clyde manifesto:*

- *Launch a 'heavy-lift' programme*

- *Set up some city region networkwide projects*

This incredibly rich discussion showed us the possibility of intervening at systemic level, in a connective way and in doing that both at big and small scale, reimagining the future of the Glasgow City Region and the Clyde Valley.

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Urban C:Lab

A RIVER RUNS THROUGH IT
A DESIGN SPRINT

Architecture &
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BURO HAPPOLD

CityUrbanist\Glasgow

GLASGOW
URBAN LAB
THE GLASGOW
SCHOOL OF ART

MACKINTOSH SCHOOL
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THE GLASGOW
SCHOOL OF ART

Glasgow
CITY COUNCIL